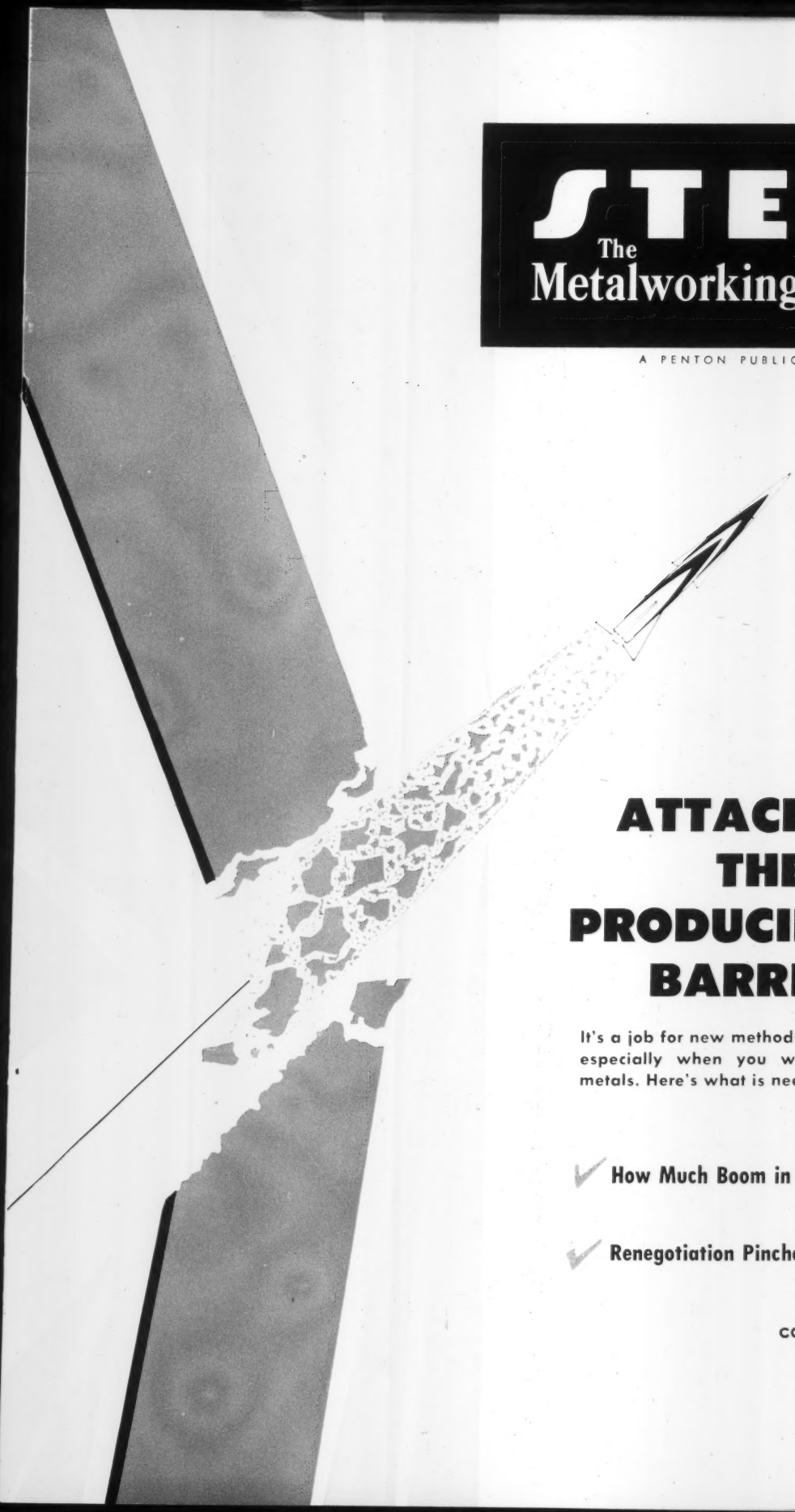
NOVEMBER 24, 1958

STEEL
The Metalworking Weekly

A PENTON PUBLICATION



ATTACKING THE PRODUCIBILITY BARRIER

It's a job for new methods and equipment, especially when you work with super-metals. Here's what is needed . . Page 100

✔ How Much Boom in the Recovery? —Page 57

✔ Renegotiation Pinches More —Page 62

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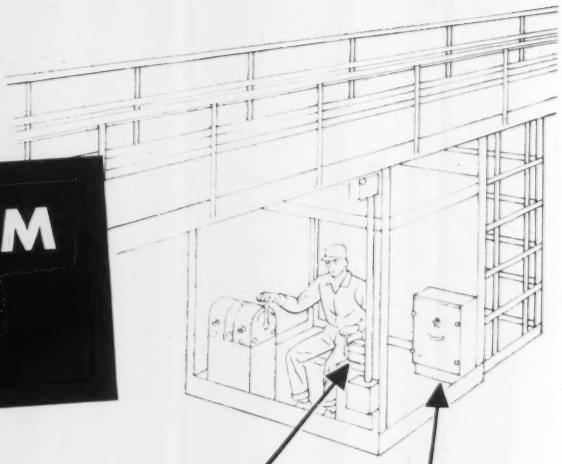
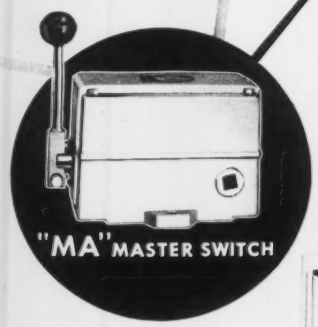
Better than Manual Control for So Many Reasons!

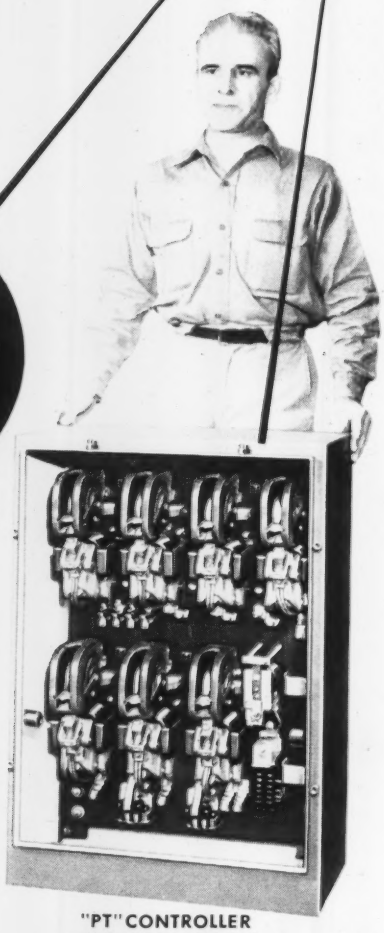
NEW LOW COST EC&M MAGNETIC CONTROL FOR DC CRANES



Now, on any DC application up to 55 HP, 230 volts, you can have the advantage of full *magnetic* control where manual control formerly was specified purely on the basis of price. At comparable cost, EC&M's new *Type PT* Magnetic Control gives you—



"MA" MASTER SWITCH



"PT" CONTROLLER
with front cover removed

Compactness—fits easily in crane cabs, on crane walkways and wherever space is limited.

3-Point Speed Control in either direction.

Reduced Motor Wear through automatic acceleration. Acceleration relays adjustable from 0.2 second up to 2 minutes per step.

Space Saving—front connection permits mounting against wall.

Maximum Safety—completely enclosed.

Fewer Spares—no manual control parts to stock.

Choice of Mounting Arrangements—MA Master Switch can be ganged with other masters or self-contained on top of the PT Controller.

Standardized Overload Protection is available. Separate panel for protection of 1 to 4 motors is smaller, simpler than protective panels used with manual controllers.

Write FOR BULLETIN 6131

Available for Hoist, Bridge and Trolley motions on cab or floor-operated cranes

THE ELECTRIC CONTROLLER & MFG. CO.
A DIVISION OF THE SQUARE D COMPANY
CLEVELAND 28 • OHIO

1236

Welding Steel Plates for Pump Beds

The two pump beds, shown here being welded back to back, are nearly 31 ft long and weigh 20,300 lb each. Bethlehem plate was used by H. F. Butler, Inc., weldment fabricators of Union, N. J., in constructing the beds. Both the outside frames and the interior "eggcrate" bracing were made from ⅜ in. plate. This type of fabrication calls for steel plates of uniform quality. And that's something you can count on when you specify Bethlehem. Bethlehem plates, together with good welding technique, give assurance of sound welds. Bethlehem plates come in a full range of sheared and universal mill sizes.

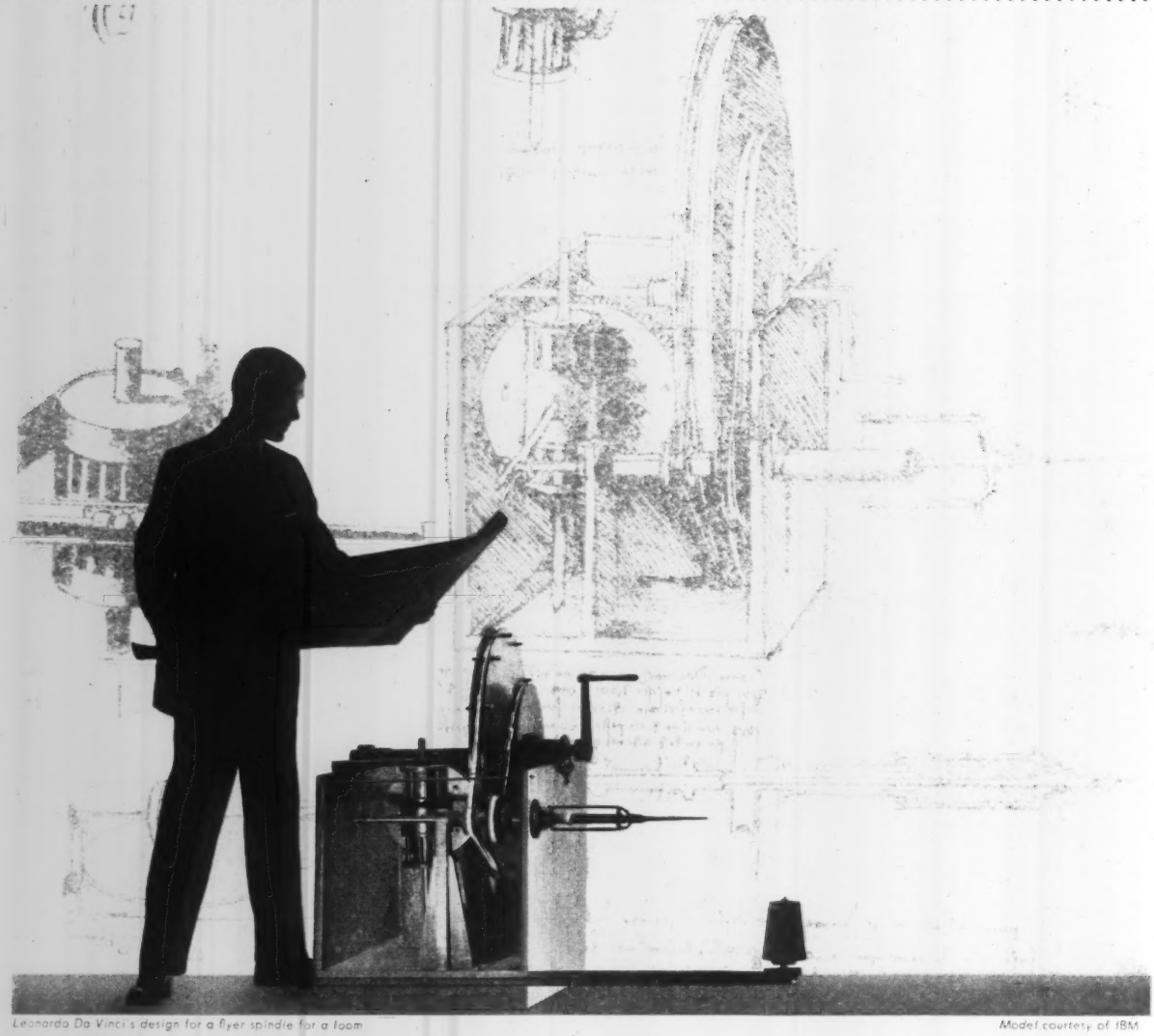
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

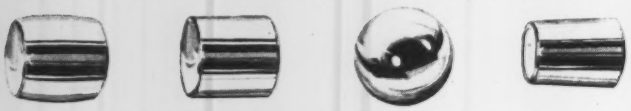
creative designing calls for an open mind



Leonardo Da Vinci's design for a flyer spindle for a loom — *Model courtesy of IBM*

EVEN DA VINCI'S DESIGN COULD HAVE BEEN BETTER WITH HELP FROM AN SKF ENGINEER—An SKF engineer never has to push one bearing over another, because SKF makes all four types of ball and roller bearings in over 3,000 sizes. This gives every SKF engineer the kind of flexibility he needs to keep an open mind on *any* bearing problem. Give your problem to SKF and see.

7812



Spherical, Cylindrical, Ball, and "Tyson" Tapered Roller Bearings

EVERY TYPE—EVERY USE

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*REG. U.S. PAT. OFF.

At Westinghouse, production men agree on economy of Wean coil processing

Mr. M. W. Stretch, right, of the Manufacturing Planning Department, and his assistant, Mr. M. Avery, discuss Wean's slitting line "after hours."

Until recently, the Electric Appliance Division plant of Westinghouse Electric at Columbus, Ohio was supplying its production lines with steel purchased in sheet form and individually resquared. Some 75 sheet sizes had to be stocked to meet varying requirements.

The installation of Wean slitting and shearing lines in August, 1957 was made after a careful cost analysis of this production process. Now, after five months operating experience, here is how production management at this Westinghouse plant summarizes the advantages of the Wean coil processing system:

Materials Savings: in addition to the initial savings realized by the purchase of coil rather than sheet, scrap is reduced by the close control and accuracy possible on Wean slitting and shearing equipment. Coil is slit in a variety of widths, from 3 to 48 inches, to supply both the shearing line and press lines, now being coil-fed.

Inventory Savings: 3 or 4 standard coil sizes now provide the production flexibility for which 75 sizes of mill-prepared sheet were previously required. In addition, prime plant space for sheet production and storage has been reduced and inventory turnover increased.

Low-Cost Versatility: differing assembly line requirements for sheet are now met quickly and easily, without production delay or the expense of special purchases.

The mechanized handling of metal possible with the Wean slitting and shearing lines also has reduced direct labor costs, freeing men for work in other production departments. And the production rate of the Wean system is more than adequate to match the plant's usage of coil and sheet: in one three-day period, 350 tons of coil were processed on the shearing line.

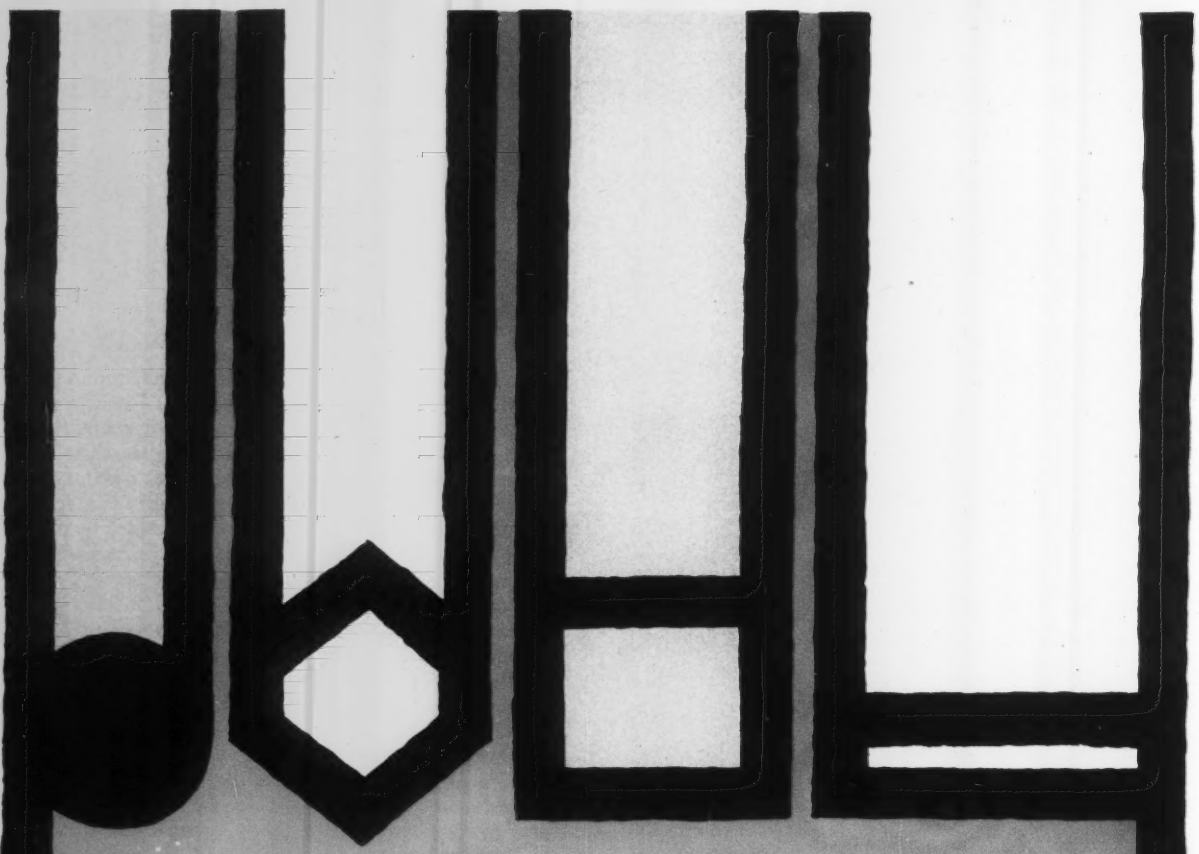
If you use sheet steel in quantity, it's likely that these same savings could result from your plant's use of Wean slitting and shearing equipment. One of our experienced sales engineers will be glad to explore with you the economics of processing from coil to fill your production requirements. May we hear from you?

WEAN

WEAN EQUIPMENT CORPORATION

CLEVELAND 17, OHIO

Detroit • Chicago • Newark



STANDARDIZE WITH VERSATILE AMBALLOY STEELS

By standardizing with versatile Amballoy—personalized steels from Byers—you can narrow your necessary chemistries to one or two. Then, through heat treating, you can get the wide variety of exacting physical characteristics you need. Standardization simplifies. Simplification saves money.

Amballoy helps metal-users shrink unproductive capital, king-size inventories, idle space, excessive handling, processing costs. Need convincing? Let the Byers metallurgist relate how Amballoy steels can be the workhorse material for your critical applications.

For further information and the name of your steel service center stocking Amballoy, write or call: Manager of Steel Sales, ATlantic 1-8110, A. M. Byers Company, Clark Building, Pittsburgh 22, Pennsylvania.

SAVE THROUGH YOUR STEEL SERVICE CENTER

Your Steel Service Center distributor stocks size after size, shape after shape, grade after grade, finish after finish of all the steels you metal-users have to have in a hurry.

He meets your requirements in 24 hours or less. He does it at a mere fraction of what it would cost you to do it yourself. It pays to let him do the slitting, flame cutting, sawing, shearing. He has the equipment, the manpower, the know-how.

Your Steel Service Center distributor is the man with the big inventory. It's his business to assume much of the risk. Let him furnish the space, the capital, the equipment. Get Amballoy steels from him.

And if you need help in standardizing on the *right* alloys for your requirements, write or call *us:* ATlantic 1-8110, A. M. Byers Company, Clark Building, Pittsburgh 22, Pa.

A. M. BYERS COMPANY

This Week in STEEL The Metalworking Weekly

November 24, 1958
Vol. 143 No. 21

EDITORIAL 55

We must become thoroughly convinced that the Soviet menace amounts to a real and present danger.

SPECIAL FEATURE 100

WANTED: A Revolution in Manufacturing

Many new production methods, machines, and materials must still be developed to solve critical aircraft and missile problems. Their applications will fan out into every branch of the metalworking field? Will you be ready to take advantage of them?

WINDOWS OF WASHINGTON 64

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Now that 1959 models are on the road, Detroit is thinking of ways to titillate the public's fancy in 1960.

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Recovery has kept on the right track, but its speed has been throttled by one walkout after another.

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STEEL, the metalworking weekly, is selectively distributed without charge to qualified management personnel with administrative, production, engineering, or purchasing functions in U. S. metalworking plants employing 20 or more. Those unable to qualify, or those wishing home delivered copies, may purchase copies at these rates: U. S. and possessions and Canada, $10 a year; all other countries, $20 a year; single copies, 50 cents. Metalworking Yearbook issue, $2. Published every Monday and copyright 1958 by The Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio. Accepted as controlled circulation publication at Cleveland, Ohio.

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FIRST to combine grinding, dressing and dressing compensation with milling

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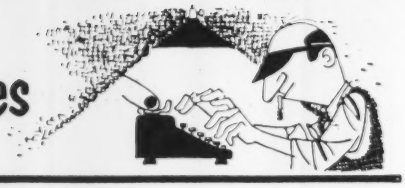
Features include tape-controlled grinding, rotary and longitudinal milling and 360° work rotation. Uses magnetic or punched tape systems. See your Ex-Cell-O Representative, or write direct. 58-51

behind the scenes



Meditative Visits

In many instances, biographers of noteworthy subjects have revealed that those subjects were not above seeking occult aid. Cleopatra, Caesar, and Hitler frequently attempted to stir up spirits when they were stumped, and Napoleon employed a full-time medium. Apparently, the recondite art of communication with the dead is an old human habit . . . and maybe that was why during the month of October we heard ourselves talking to Abraham Lincoln, Christopher Carson, Carrie Jacobs Bond, and Buffalo Bill. During the course of an extended vacation trip, we visited Springfield, Ill., Taos, N. Mex., Forest Lawn Cemetery (Los Angeles), and Golden, Colo.

Mr. Lincoln, whom we hold in the greatest esteem and affection, chuckled as we stood near his plain marble casket. "You think Springfield has changed a lot in the last 100 years, eh? Well, you ought to see Washington: Democrats have quit drinking tea there because it sounds too much like something golfers use." Suddenly he grew more solemn. "Don't worry about the Union. Her enemies within and without will never prevail."

A few days later, in the mountains of New Mexico, we stood near the patch of ground that holds the remains of Kit Carson. Carson was a small man, physically, but he was amazingly tolerant and practically without fear. He began as a saddler's apprentice and ended by riding into an American Valhalla.

"I was never much for book-larnin'," came Christopher's tones above the whispering of the pines, "but I do know this, and you can pass it along: When you ain't afeared, and you ain't hatin', you're really livin'."

We were trapped into visiting Forest Lawn but experienced a measure of comfort when we learned that Carrie Jacobs Bond reposed close at hand. Mrs. Bond said that the only thing better than the end of a perfect day was the beginning of one, but the balance of her remarks were drowned out by our guide, who had worked himself up into a perfect lather over some stained glass.

On our way home we paused briefly at Golden, Colo., and stood in the sunshine on top of Lookout Mountain, where William F. Cody rests. Old Buffalo Bill knew kings and presidents, cutthroats and tramps, bankers and scholars, but he always had a soft spot in his heart for savages and good whisky . . . and the Great American West.

"She ain't all filled up yet, not by a long shot," he said, glancing at the Rockies rolling beyond the horizons to the west, and at the prairies to the east. "There's plenty of room for adventure yet—and excitement is where you look for it!"

To Exhume New Field

This fleeting (and happily premature) association with cemeteries revealed incidentally that metalworking has a prodigious stake in the mortuary and interment fields. Rails, fences, urns, tombs, caskets, slabs, structurals, monuments, and countless other items call for such materials as stainless steels, bronze, copper, cast iron, and aluminum. Perhaps the subject is too delicate to exploit to its full potential, but sure enough the time is coming when some enterprising metalmen are going to corner the burial market. They won't be afeared; they won't hate anybody; they will have confidence in the Union; they will delight in the beginning of a perfect day; and they'll look for excitement in a place where one would least expect to find it: In a cemetery.

For Showgoers

A short article appearing on Page 68 will give you pause to think. It concerns trade shows, association expositions, and merchandise displays at conventions. People who exhibit in them grow weary; delegates suffer flat feet; salesmen wear frozen smiles; and everybody eats aspirin and Bufferin and Anacin like crazy, depending on what pharmaceutical advertising has influenced them the most. We think STEEL's slant is refreshing.

You Can Do This with Es

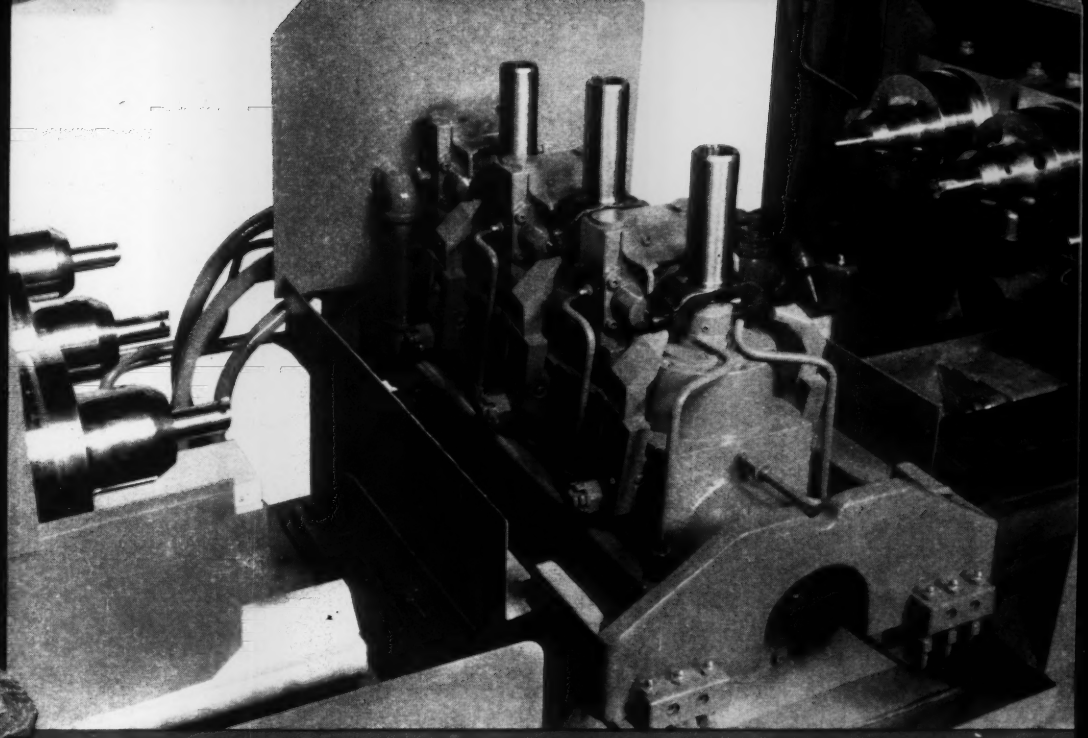
The rug cutters cut rugs in all directions. S. Feigenbaum, chief industrial engineer, Jones & Laughlin Steel Corp., Pittsburgh, cut his properly in two pieces, as did Charlsie and Faye, General Steel Castings, Granite City, Ill. (On the 16 ft side you stand 4 ft from the left, cut 3 ft ahead, 4 ft to the right, 3 ft ahead, 4 ft to the right, 3 ft ahead.)

Did we ever run this one before? Here is a sentence in which the only vowels are Es, which we have placed in their proper places. All the other letters are consonants. Can you fill in the sentence? We'll give you one word for a start:

THESE - - - E E - E - - E - - E - E - E - - E - - E - , - E - E - E - , E - - E E - E - ; E - E - - - E - - - E - E - E - - E E - E - - E - - - E - E - - E - - E - - E - .

Shrdlu

(Metalworking Outlook—Page 51)



RIGHT: Vertical splined arbors and clamps holding shoulders of bores are operated hydraulically.

BELOW: Universal yoke showing two holes bored simultaneously.

Two-Way Boring Speeds Parts Production

58-9

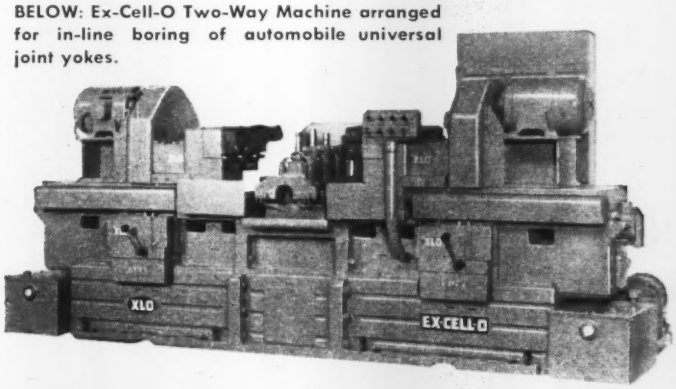
This Ex-Cell-O Precision Two-Way Boring Machine cuts production time of universal yokes for a manufacturer of automotive components by performing operations at both ends of a part—simultaneously.

Two independent machines interlocked electrically for central push-button control, the two-way unit bores two holes in line through malleable iron yokes held in a three station fixture. Both machine sections have three spindles on each slide for high production.

Two, three or four standard, self-contained way units can be easily arranged around a fixture at any angle the work requires. And like all Ex-Cell-O Precision Boring Machines, Way Machines are readily adaptable to different size workpieces—light, medium or heavy parts—and varying material requirements.

For complete information on versatile Ex-Cell-O Way Machines that can save time in your operation, contact your local Ex-Cell-O Representative, or write direct.

BELOW: Ex-Cell-O Two-Way Machine arranged for in-line boring of automobile universal joint yokes.



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ANOTHER INDUCTO INSTALLATION...

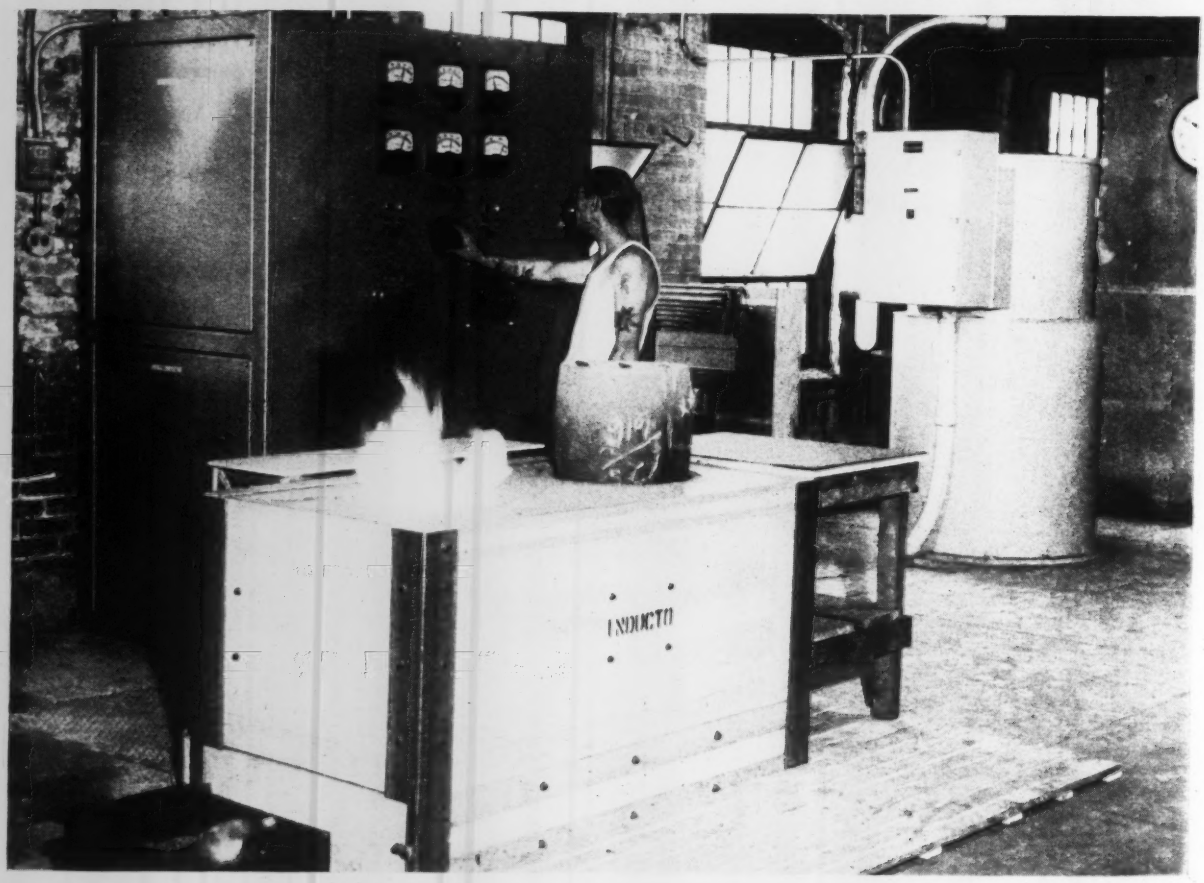

PHOTO COURTESY OF BUSHINGS, INC., PHILA. 32, PA.

The Foundry and the Feather Duster

Shortly after Bushings Incorporated, a Philadelphia manufacturer of cast bronze bushings and bearings, replaced four oil-fired furnaces with an INDUCTO Push-Out induction furnace, the management received a strange request . . . the foundrymen wanted a feather duster. They liked the INDUCTO furnace and control so much, and were so pleased with the cooler and cleaner foundry, that they wanted a feather duster to keep the equipment clean.

And the management was pleased too! For in addition to happier and more productive employees, they gained other benefits. The higher melting speeds and precision control of the INDUCTO Push-Out furnace helped reduce metal losses. In addition, it became possible to reclaim metal from melts and machining. Production time was saved in the handling of crucibles and the transferring of melts. In fact, the one INDUCTO Push-Out furnace provided as many melts in six hours as the four oil-fired furnaces did in eight.

Why not learn for yourself how INDUCTO furnaces and precision control can help modernize your foundry and save production dollars? Write today for more complete details.

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corporation
412 Illinois Ave. Delanco, N. J.

Youngstown tin plate

will help feed the families of her day

Automized, round-the-clock canning of foodstuffs in *her* day will feed more families than the world has ever known. Youngstown, today, is anticipating tomorrow's need for tin plate —in increasing quantity and quality. Continuing advancements in facilities, the result of tin plate research, make certain that millions of families in *her* day will enjoy the finest of food... *packaged in Youngstown tin plate.*

THE
YOUNGSTOWN
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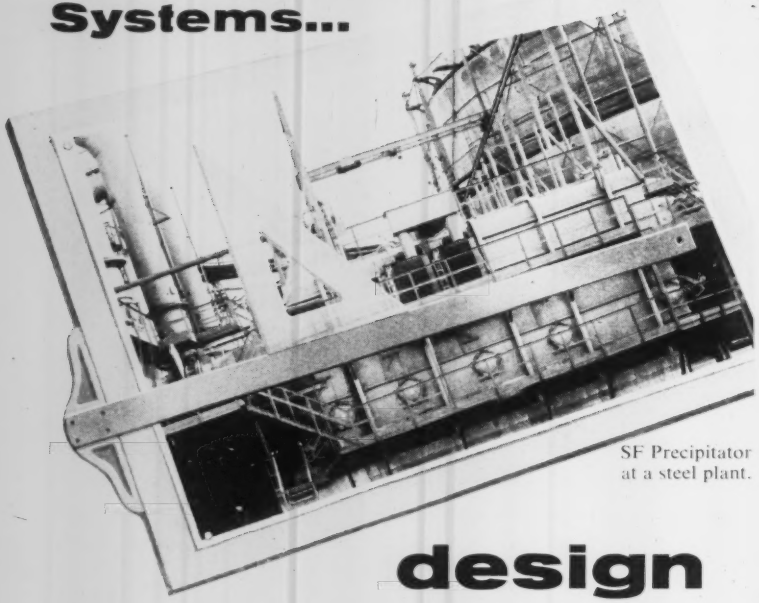
Manufacturers of Carbon, Alloy and Yoloy Steel
Youngstown, Ohio

In Dust Collection Systems...



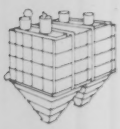
SF Precipitator at a steel plant.

design makes the difference

Higher efficiency of Buell 'SF' Electric Precipitators is the result of exclusive engineering features. For example, Buell's *Spiralectrodes* emit 50% to 100% more electrons than other types . . . and *maintain* their efficiency. Positive gas flow control through adjustable baffles prevents scouring and eddying. And Buell's Unique Continuous Cycle Rapping practically eliminates "puffing".

BUELL CYCLONES

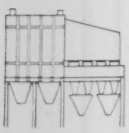
Lower installation cost of Buell's time-proved simplified design makes erection faster and easier. Spiralectrodes, for example, are self-tensioning, require no weights. Flexibility of power supply means easier installation, operating safety.



SF ELECTRIC PRECIPITATORS

Lower maintenance cost is the result of many details of superior design. And sectionalized design permits shutting down part of a unit without interrupting service in the rest of the unit.

Get full information: write for a copy of "Buell SF Electric Precipitators", a 22-page booklet. Write to Dept. **26-K**, Buell Engineering Co., Inc., 123 William Street, New York 38, N. Y.



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Experts at delivering Extra Efficiency in

DUST COLLECTION SYSTEMS

LETTERS TO THE EDITORS

STEEL Creates Understanding

I have read with pride and pleasure, "Purchasing for Profit" (Oct. 13, p. 89).

This well-written factual story of the function of purchasing, carrying the weight of your prestige and reaching a sizable portion of top management in the metal using industry, creates a kindly understanding which makes the efforts of the conscientious purchasing agent more effective and pleasurable.

May I thank you for this excellent treatment.

N. J. Gibbins

National Chairman
Public Relations Committee
National Association of Purchasing Agents
Lansing, Mich.

Article Interests Production Men

Please forward a copy of "Plant Superintendents Carry the Weight of Production" (Nov. 3, p. 50).

As usual, this issue carried a variety of informative material, and was read by me personally, as well as by other members of the management staff.

R. Luerding

Plant Superintendent
Lee-Rowan Co.
St. Louis

• • •

May I have a reprint of your interesting article?

John Zakanycz

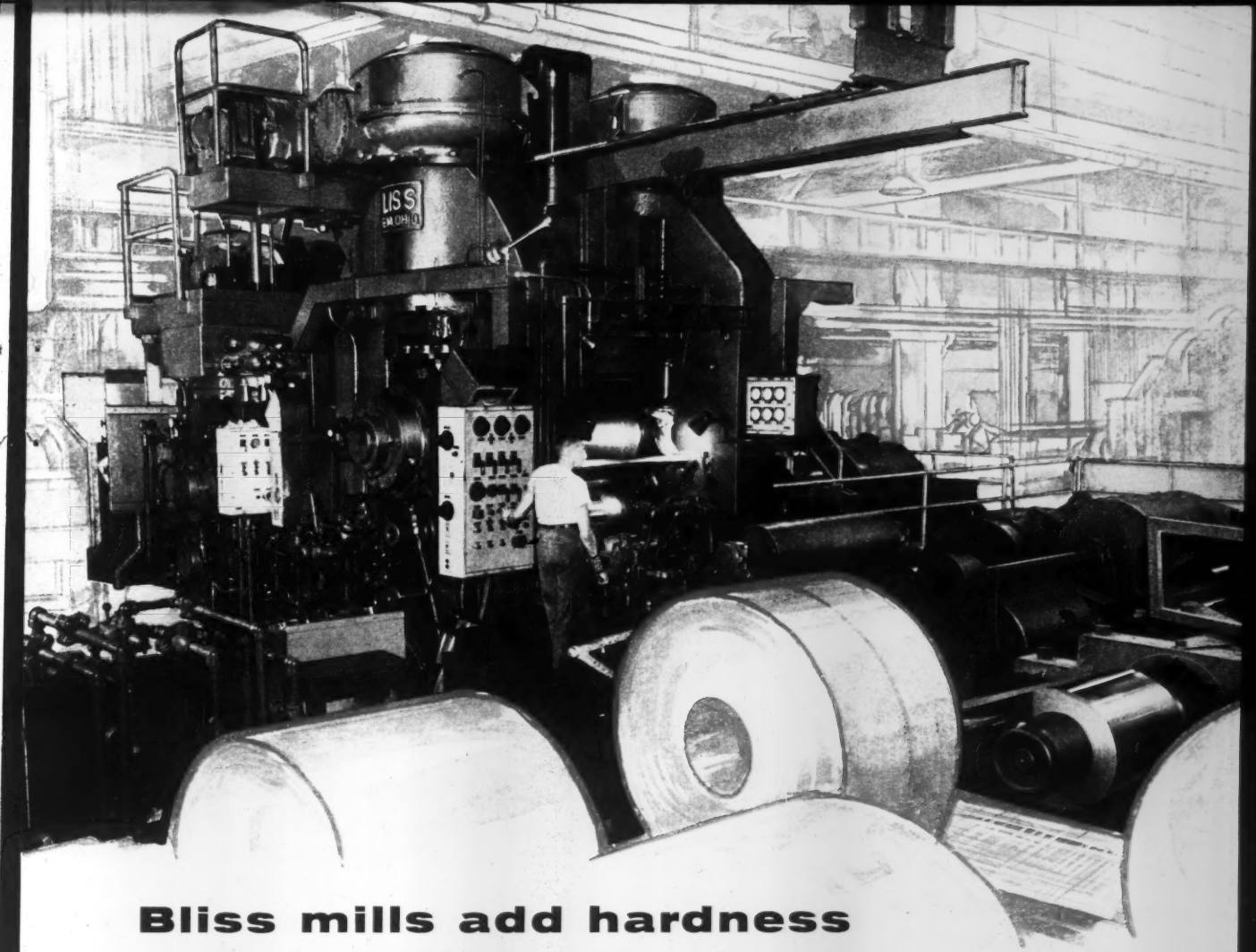
Manufacturing Staff
Worthington Corp.
Harrison, N. J.

Finds Improved Welding Method

In STEEL's "Technical Outlook" (Nov. 3, p. 69), I read about a technique for welding thin metals perfected by Rohr Aircraft Co.

About two years ago, I discovered an improved method for welding thin metals with the Heliarc. An edge is turned up past 90 degrees so that when two pieces are butted together, the edges form a V. This V acts as a ditch down which molten metal flows ahead of the

(Please turn to Page 12)



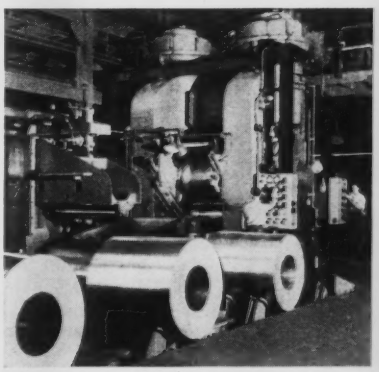
Bliss mills add hardness to Weirton Steel's line of strip

Weirton Steel Co., Division of National Steel Corp., the nation's largest independent producer of tin plate, uses a Bliss mill to achieve exacting temper and quality of its strip prior to plating. It is a four-high, two-high two stand tandem mill recently installed in its Weirton, W. Va., plant.

Through this unit Weirton has rolled a wide variety of steels in gages ranging from .00435 to .0147 inches and at an average maximum speed of 4,500 feet per minute. Well known products such as Weircote and Weirzin zinc coated steel are just two of Weirton's steel products to which this mill contributes.

A second Bliss mill tempers high-carbon, high-phosphorous, deep-drawing and galvanizing steels at the rate of 800 tons a day, while a new Bliss 48-inch slitting line is used to slit galvanized steel in gages from .0135 to .135 inches at speeds of 200 to 1,000 fpm. Both rolling mills are equipped with Amerigear-Bliss spindles.

These three installations provide one more example of the ready acceptance of the name of Bliss in the rolling mill industry—both here and abroad. To learn how Bliss equipment can help increase your rolling capacity, simply write for our new 84-page Rolling Mill Brochure, Catalog 40-B.



Four-high temper mill handles 30,000-lb. coils at speeds up to 3,500 fpm...has rolled 1,000 tons in a single day. Back-up rolls were supplied by Bliss' Mackintosh-Hemphill Division.

BLISS
SINCE 1857 ®

Bliss is more than a name . . . it's a guarantee

E.W. BLISS COMPANY, Rolling Mill Division, Salem, Ohio

Subsidiary: The Matteson Equipment Company, Inc., Poland, Ohio

SHOW STOPPER

It's the new Torrington Verti-Slide, the first major innovation in the field of 4-SLIDE equipment in 50 years!

This machine was designed to meet a growing need for greater productivity and profitability in the cost-critical area of wire and strip forming.

Seldom before has a new machine created such immediate and widespread interest. We urge you to get the full story. Write or call today.

THE TORRINGTON MANUFACTURING COMPANY

TORRINGTON, CONNECTICUT • VAN NUYS, CALIFORNIA • OAKVILLE, ONTARIO

LETTERS

(Concluded from Page 10)

arc. Molten metal closes any space where metal contact is poor before the torch arrives at the location. Argon also flows down the ditch.

Penetration is far better than when the edges are turned up at 90 degrees because the arc does not have to burn through much metal. It is so good that there is nearly as big a bead on the bottom of the weld as on the top.

Most of our work was done with aluminum. With this new technique blowholes are extremely rare, penetration is excellent, and it isn't necessary to clean the aluminum. We have found this also works well for copper and stainless steel.

G. H. Morey

Glas-Col Apparatus Co.
Terre Haute, Ind.

Welcomes Frank Appraisal

STEEL's "Copper and Its Alloys" (Oct. 27, p. 75) is going to be of real value to us. We will use reprints extensively within our organization to keep our people informed about the copper industry.

As specialists in tube and tubular products, we welcome the over-all story of what's going on in rod, sheet, wire, and other fabricating facilities.

The frank appraisal of what an industry's customers find to be our shortcomings is also welcome. We attach great significance to your impartial reporting. We think we are smart enough to do something about it.

Frank W. Oakes

Director of Industrial
and Public Relations
Wolverine Tube Div.
Calumet & Hecla Inc.
Allen Park, Mich.

• • •

The information contained in this study will be useful to us in the conduct of our business.

Herman B. Director

Herman B. Director Associates
Washington

• • •

All I hear is favorable comment on your study. May I add my congratulations? It is a swell job!

O. H. Niendorff

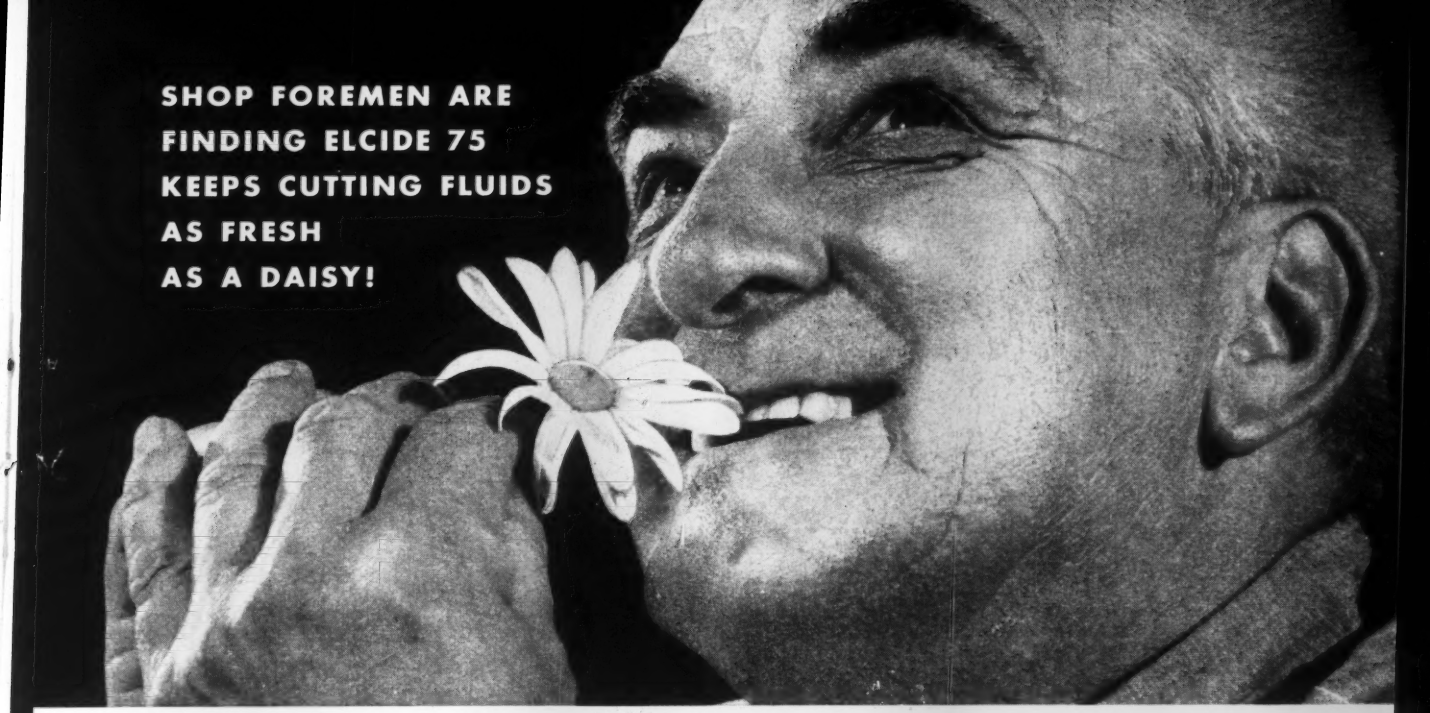
Assistant Advertising Manager
Anaconda Co.
New York

Sets Record Straight

Just to set the record straight, the average weight of a standard AAR car journal bearing is 24 lb, not 7 lb, and there are 1.74 million freight cars in regular interchange service, not 1.5 million as stated in "Copper and Its Alloys" on Page 84.

I. E. Cox

Railroad Products Div.
American Brake Shoe Co.
St. Louis



You have less down time when you treat emulsions with new ELCIDE 75™

One ounce of Elcide 75 per each four gallons of standard duty soluble oil emulsion controls the harmful bacteria that shorten emulsion life. In one shop test, emulsions treated with Elcide 75 lasted 5½ times longer than untreated emulsions!

Longer emulsion life means less down time and more efficient use of labor. The time lost on recharging emulsions is greatly reduced, and so is the size and expense of disposal problems.

Extended shutdowns are less of a problem when emulsions are treated with Elcide 75. Since Elcide 75 can be safely stored for long periods, some plants have found a reserve supply is extremely useful as protection for emulsions during extended shutdowns such as vacations and inventories.

Plant efficiency is increased several ways. Elcide 75 controls bacteria that may cause staining and corrosion. It is safe and nontoxic to employees, and its antibacterial action eliminates objectionable odors.

Elcide 75 effectively controls bacteria that cause odor, staining, corrosion, and emulsion breakdown because it is a *combination* of two powerful antibacterial agents. It includes a powerful new compound related to one of the safest and most effective bacterial inhibitors used in the exacting field of medical surgery. Elcide 75 covers a much wider range of bacteria than the single inhibitors commonly used in emulsions today.

PRODUCT SPECIFICATIONS ELCIDE 75

Active Ingredients—Sodium Ethylmercuri Thiosalicylate (Thimerosal) and Sodium *o*-phenylphenate.

Package	Price per Gal.
1-gallon polyethylene	$8.50
5-gallon polyethylene	$8.00
55-gallon stainless steel	$6.50

Sold only through selected distributors.

Lower your operating costs. If you use standard duty soluble oil emulsions, Elcide 75 can save you money. Production goes up as costs go down. The reduction in total soluble oil purchases can more than pay for the cost of using Elcide 75. Why not try Elcide 75 in your plant operation soon?

For more information or to place your order, write or phone:

ELCIDE 75™

PATENT PENDING

Lilly

Lilly's brand of bacterial inhibitor for cutting fluids

ELI LILLY AND COMPANY, AGRICULTURAL AND INDUSTRIAL PRODUCTS DIVISION, INDIANAPOLIS 6, INDIANA. TELEPHONE: MELROSE 6-2211

NEW

FROM REPUBLIC

CARBON COMPATIBLE IRON POWDERS

How they cut costs, broaden the application of powder metallurgy

The big news in powder metallurgy continues to come from Republic. As a result of Project 501, Republic has developed and is producing at its Toledo, Ohio, plant, two types of carbon compatible iron powders. Designated as types MS and HS 6460, these powders represent a major break-through for the powder metallurgy industry. They are suitable for a whole new group of applications previously restricted to other materials of construction. Here is how they can cut your costs and broaden the application of powder metallurgy.

TYPE MS is a soft, higher purity powder with excellent carbon compatibility. It can be used for comparable strength structural parts at *lower cost* than obtainable with copper. Using only 1% graphite, MS can provide physical properties previously attainable only with 7-10% copper.

MS is ideally suited for use in electrical part and electric motor applications—pole pieces, cores, permanent magnets, armatures.

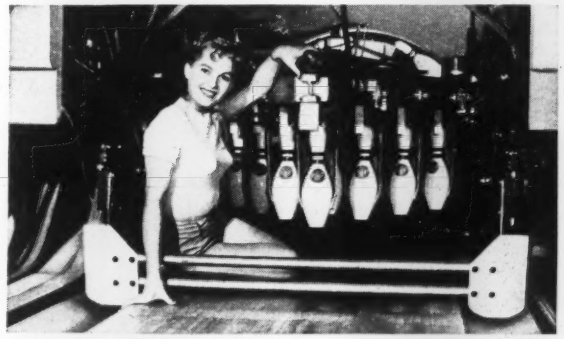
The softness of MS makes possible the fabrication of larger parts on normal pressing equipment.

TYPE HS 6460 HIGH STRENGTH POWDER is suited for use in all major applications of ferrous powder metallurgy. It makes possible higher tensile strengths than ever before achieved with iron powder.

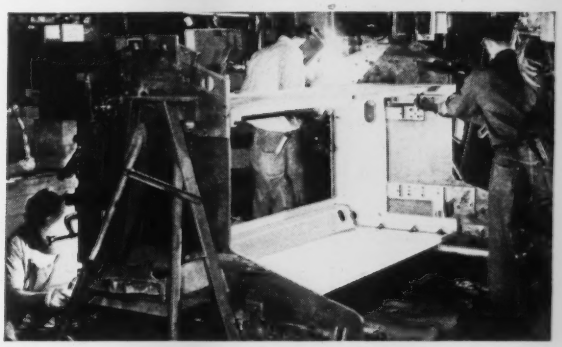
Can be used for comparable strength structural parts at lower manufacturing costs than obtainable with copper infiltration. Excellent carbon compatibility enhances its ability to be heat treated. Additional manufacturing economies can be obtained because fewer operations will be required to obtain high density, higher strength parts.

Our metallurgists and engineers are ready to help you utilize all the advantages of Republic Carbon Compatible Powders. Just mail the coupon to obtain their services, or for technical data sheets on Type MS and Type HS 6460 Powder.

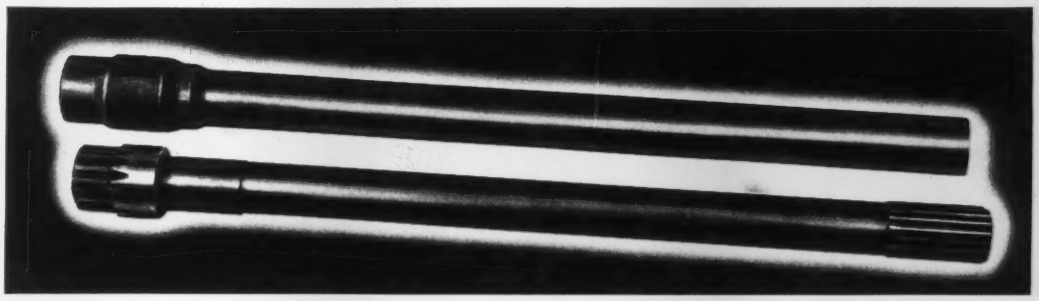
other Republic products for fast, economical production



AMF CUTS COSTS, builds a better pinspotter with Republic ELECTRUNITE® Mechanical Tubing. On the initial order, ELECTRUNITE saved American Machine & Foundry Company, Brooklyn, New York, $34,000 in manufacturing their famous AMF Automatic Pinspotter. AMF was able to eliminate boring and grinding operations because ELECTRUNITE met O.D. tolerance requirements. This feature resulted in a savings of $15,000 in fabricating operations. Another $19,000 was saved on the cost of ELECTRUNITE as compared with tubing previously used. In uniformity, quality, original costs, Republic ELECTRUNITE Mechanical Tubing can save you time and money, too. Call Republic, or mail coupon for facts.



STRENGTH, CORROSION-RESISTANCE, AND ECONOMY are assured in Tyler refrigerated food sales-cases by proper design and material selection. The Tyler Refrigeration Corporation, Niles, Michigan, and Waxahachie, Texas, has found Republic Galvannealed Sheets ideal for inner and outer walls of these units. Interior parts call for strength and corrosion-resistance. Manufacturing requirements call for good ductility. Republic Galvannealed meets all of these requirements and provides initial and long-term economy as well. Its tight, uniform zinc coating, furnace fired for further corrosion-resistance, will take all ordinary forming operations. Shear, blank, pierce, form, flange, solder, deep draw, bead it with ease. Send coupon for details.



NEW FABRICATING PROCESS MEANS ECONOMY. Ford Tractor power take-off counter-shafts cost less to produce using Republic Die-Form blanks, as compared with previous materials. Blank is shown on top . . . completed shaft below. Die-Form is a new method of cold forming hot rolled carbon, alloy, or stainless steel bars into multi-diameter blanks ready for final machining. Since Die-Form blanks closely approximate the completed part, final machining is minimized. Handling costs for raw material and scrap disposal are reduced—production rates increased. Die-Form Process improves machinability of any given steel analysis. Permits further savings through use of higher feeds and speeds. Mail coupon for complete facts.

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World's Widest Range of Standard Steels and Steel Products

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Send more information on: ☐ MS Powder ☐ HS 6460 Powder ☐ Die-Form ☐ Galvannealed Sheets ☐ ELECTRUNITE Tubing

Name _____ Title _____

Company _____

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City _____ Zone ____ State _____

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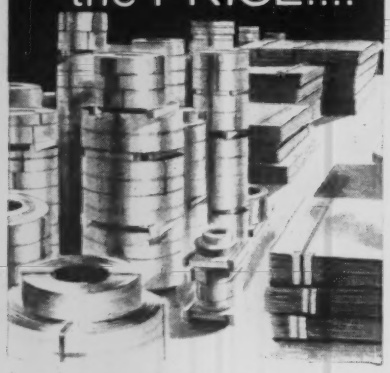
the PRICE!...



immediate availability of material
for instance

On hand always *in our plant* is an extensive inventory of a wide variety of materials*, available normally only on special order from mills.

No need for our customers to wait for such materials!

For your next hurry-up stampings . . . look for this plus beyond the price . . . *immediate availability of material* . . . and let us quote before you buy!

A brochure is yours for the asking!

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"America's Leading Job Stamping Manufacturer"

*Our stock of materials includes—close-tolerance spring steel, both tempered and annealed; copper and copper-base alloys, various analysis of carbon steels, and imported Swedish Flapper-Valve steel.

Look to Detroit!

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"ELECTROMET columbium alloys suit our needs best"

Columbium can be efficiently added to carbon and alloy steels and high-temperature alloys with ELECTROMET ferrocolumbium or ferrotantalum-columbium. Electric furnace and open-hearth operators can use these alloys to produce:

- Carbon and low-alloy steels, where columbium promotes a fine-grain structure for improved strength and weldability.
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- Stabilized austenitic stainless steels, where columbium inhibits intergranular corrosion.
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Ask your ELECTROMET representative for further details.

ELECTRO METALLURGICAL COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N.Y.

Welding Cb-stabilized stainless.
For information on columbium uses, contact ELECTROMET, pioneer in columbium development.

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UNION CARBIDE

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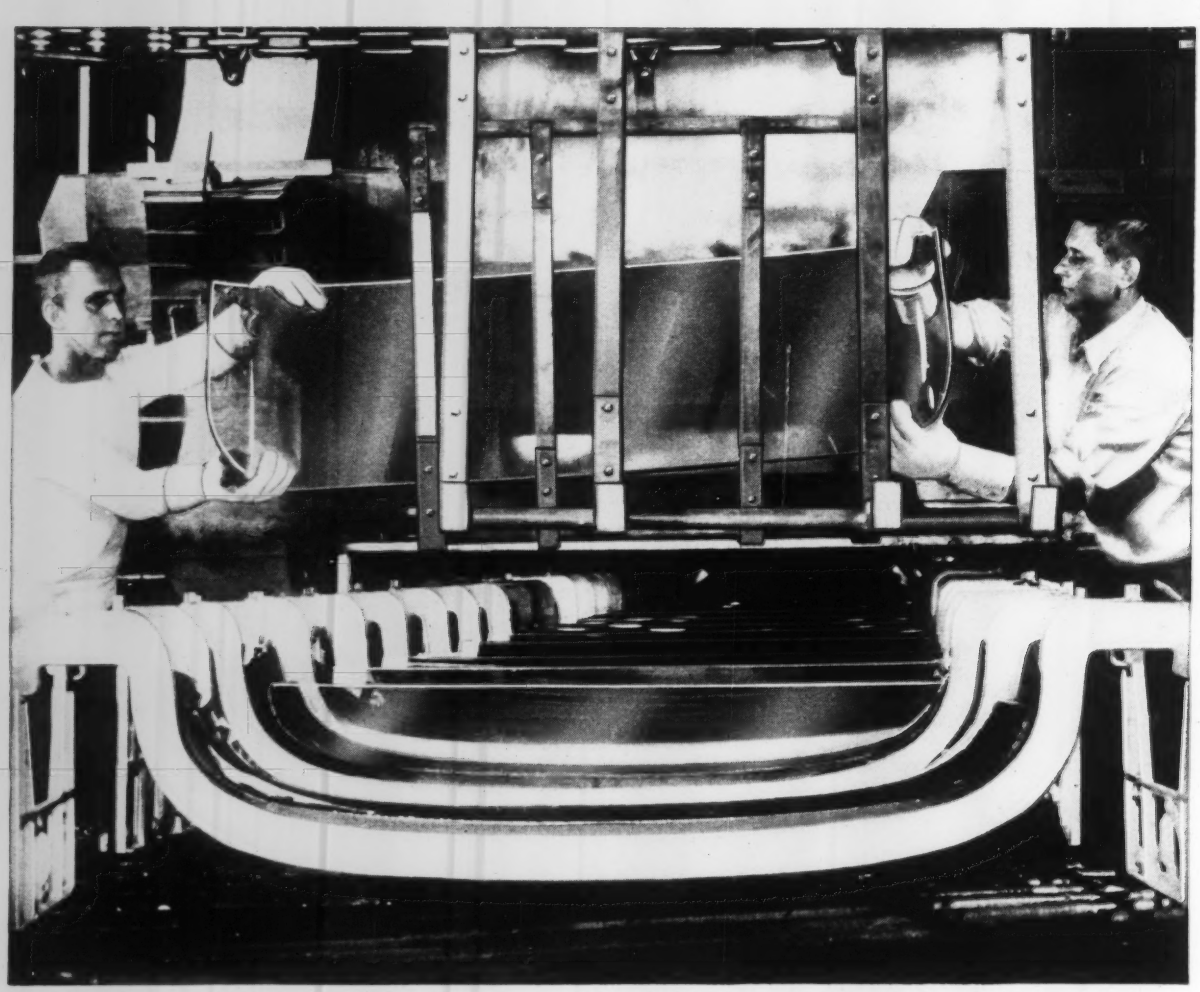
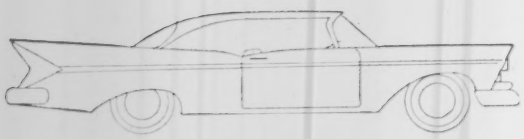


Greater visibility, trimmer lines in new car styling... thanks to GAS



With nearly 7,000,000 cars being produced annually, the increased use of glass has demanded major production improvements in the manufacture of new panoramic windshields and back-lights.

Since the forming of the intricately curved glass is done at a temperature at which glass is soft and can be bent, the production process challenged heat process engineers to design new automatic equipment capable of mass producing these large precision glass pieces.

Selas engineers, working with the nation's leading glass manufacturer, discovered that Gas could produce the proper time-temperature cycle demanded by this process, efficiently, quickly, reliably. The flat glass is conveyed under radiant Gas burners which bring the glass quickly up to bending temperature and allow the shaping of windshields, with reproducible uniformity, at high production rates.

The production of this wrap-around windshield is another example of the contributions modern Gas equipment is making to American manufacturing. If you have an operation demanding precise process heating, call your local Gas Company's Industrial Specialist and discuss the economies and results you, too, can get with modern Gas equipment. *American Gas Association.*

See Playhouse 90 with Julia Meade on CBS-TV. Watch local listings for time and station. Sponsored by your Gas Company and the Gas Industry.

* Stainless Steel welding information:

*Keep it clean

You get strong, tight joints when you weld Stainless Steel, but you have to make sure the surfaces have been thoroughly cleaned. Any grease, oil or dirt on the welded surface might affect the corrosion resistance of Stainless.

When you want to repair a crack, it's a good idea to chip out the cracked area completely so you're sure that only clean, solid metal is exposed. And remember, there are a lot of different kinds of Stainless Steel and they don't all react the same way. Be sure you handle each job right—check the "Stainless Steel Fabrication Book" before you start. If you don't have a copy of this 130-page guide, write on your company letterhead to United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS Stainless Steel is available through your USS representative or your local steel service center.

USS is a registered trademark

United States Steel Corporation—Pittsburgh
American Steel & Wire—Cleveland
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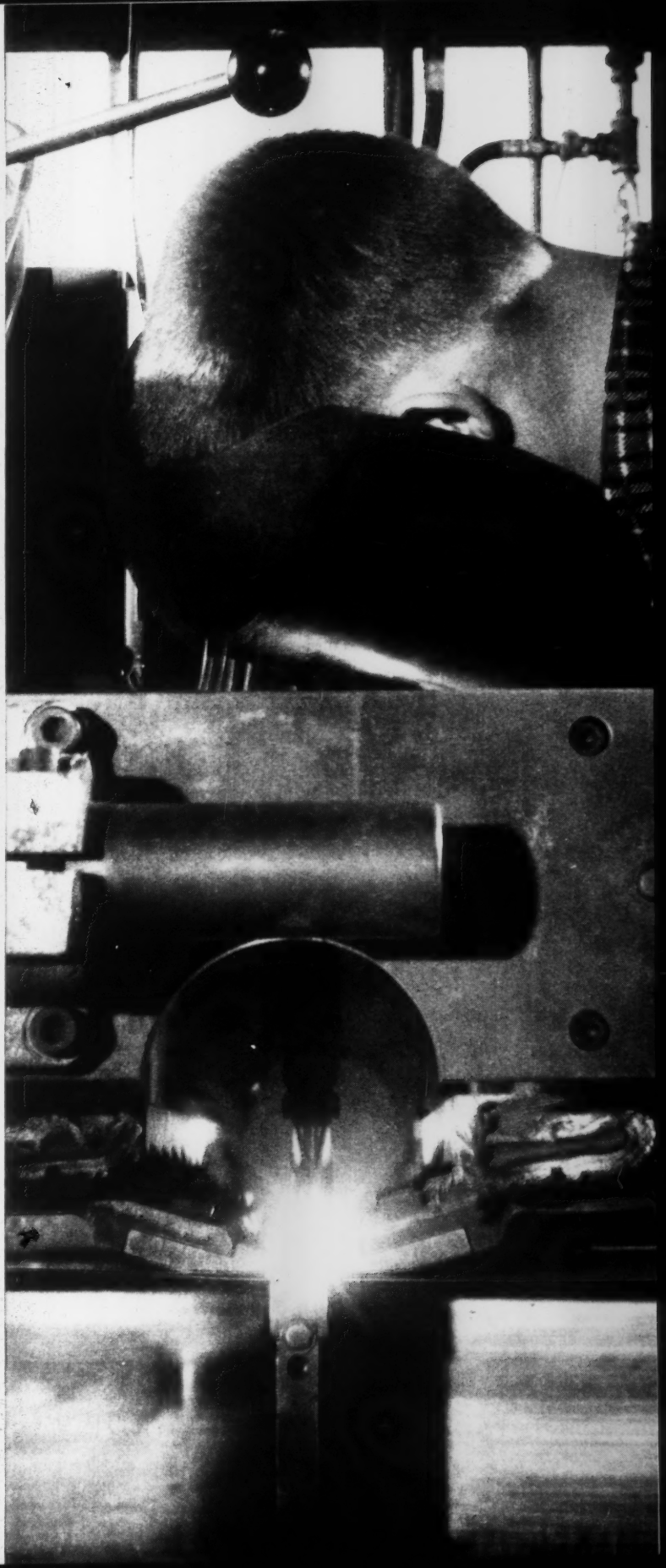

Interested in Oxygen? Nitrogen? Argon?

Why Liquid Carbonic for its New

The Liquid Carbonic Division of General Dynamics doesn't take unnecessary chances. This prominent firm had confidence that they could rely on Messer to design and engineer a new air separation plant that would give more than just "satisfactory" results.

What Happened?

American Messer met the production schedule, and in February, this Liquid Carbonic plant at Urbana, Ohio went on stream. This tonnage plant is exceeding specifications—it can and does turn out liquid products at purities much higher than specified. The plant is also exceeding specifications in capacity and output.

Generous design margins and comprehensive automatic instrumentation give exceptional flexibility and completely stable operation at minimum operating cost.

You Can Depend on Messer

Messer-engineered plants have been operating with outstanding success in the U.S.A. since 1913 and for more than 50 years in many other countries. Where can *you* profitably use tonnage oxygen, nitrogen, or argon? If you decide to build your own plant, American Messer can assure you of best value for your investment dollar. Your inquiry will be welcomed.

Messer

AMERICAN MESSER CORPORATION

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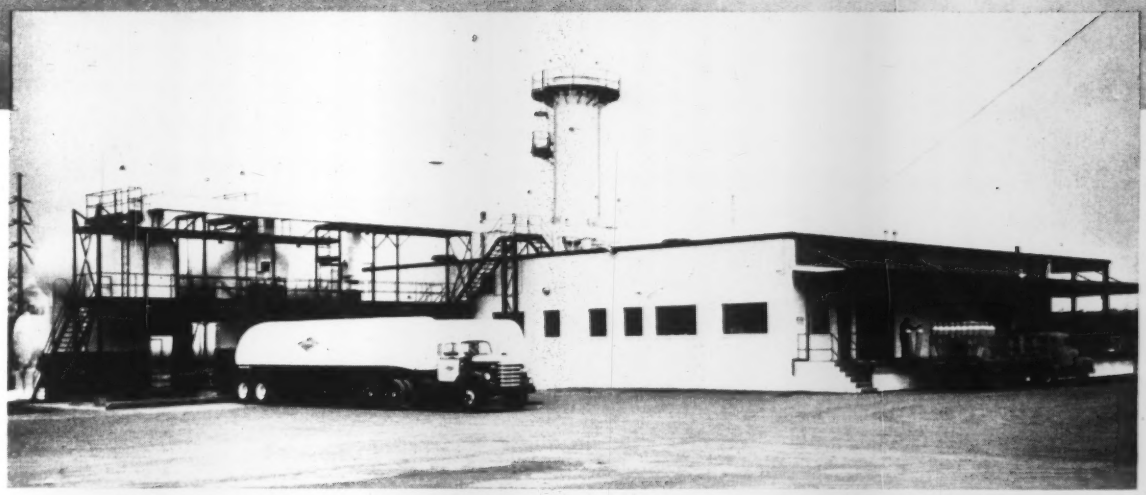
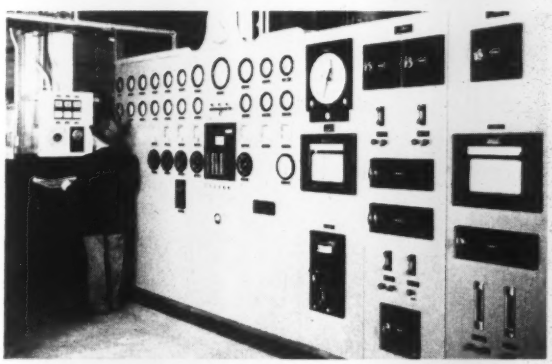
"THERE IS NO SUBSTITUTE FOR MESSER EXPERIENCE"

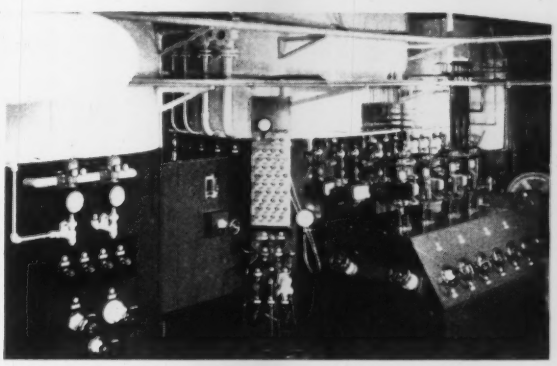
Chose MESSER Oxygen Plant



HIGHLY EFFICIENT . . . View of the Urbana, Ohio plant showing the Messer fractionating column extending above the building.



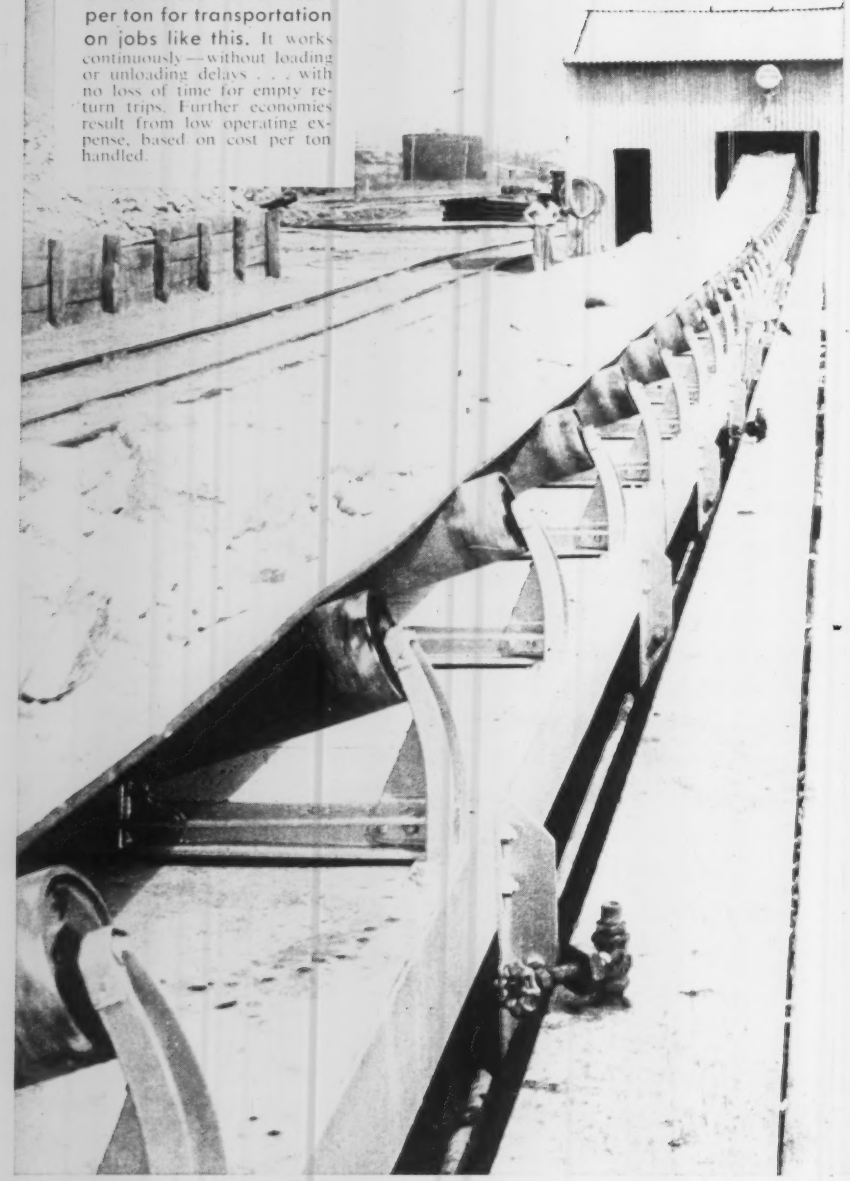
CONTROL PANEL indicating, recording, and controlling all important process variables shows the high degree of instrumentation typical of Messer plants.



CONVENIENCE—Careful piping design brings major valves to convenient, logical locations for ease of operation and maintenance. Test and sample connections are brought to a central control board.

NOTHING BUT A BELT CONVEYOR

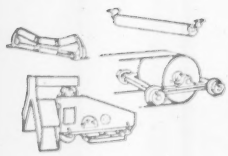
achieves such a low cost per ton for transportation on jobs like this. It works continuously—without loading or unloading delays . . . with no loss of time for empty return trips. Further economies result from low operating expense, based on cost per ton handled.



. . . AND NO ONE BUT LINK-BELT

offers such complete service for engineering belt conveyors. Calling on unequalled depth of experience, Link-Belt can do a quick but thorough job of analyzing your requirements . . . back up recommendations with a complete line of equipment.

OVERALL ENGINEERING



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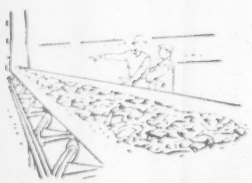
SKILLED ERECTION



ASSURED SATISFACTORY PERFORMANCE

No wasting of engineering manhours on details . . . no need to exchange drawings with scattered suppliers with Link-Belt handling your belt conveyor installation. You get all equipment from one source . . . the specialization that only industry's most comprehensive line of idlers—plus pulleys, drives, terminal machinery and auxiliary equipment—can offer. From design through erection, Link-Belt takes on total responsibility. Our nearest office has full information.

14.768

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LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville (Sydney), N.S.W.; South Africa, Springs. Representatives Throughout the World.

CALENDAR
OF MEETINGS

Nov. 30-Dec. 5, American Society of Mechanical Engineers: Annual meeting, Statler-Hilton and Sheraton-McAlpin Hotels, New York. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: C. E. Davies.

Dec. 1-5, Exposition of Power and Mechanical Engineering: Coliseum, New York. Sponsor: American Society of Mechanical Engineers, 29 W. 39th St., New York 18, N. Y. Secretary: C. E. Davies.

Dec. 2, Electric Overhead Crane Institute: Annual meeting, Statler-Hilton Hotel, Washington. Institute's address: 1 Thomas Circle, Washington 5, D. C. Executive secretary: Joe H. Peritz.

Dec. 2-3, Spring Manufacturers Association: Annual meeting, Barbizon-Plaza Hotel, New York. Association's address: 222 Main St., Bristol, Conn. Secretary: George E. Underwood.

Dec. 3-5, AIME Metallurgical Society: Electric furnace steel conference, Hotel Statler-Hilton, Detroit. Institute's address: 29 W. 39th St., New York 18, N. Y. Secretary: Ernest Kirkendall.

Dec. 3-5, National Association of Manufacturers: Congress of American Industry, Waldorf-Astoria, New York. Association's address: 2 E. 48th St., New York 17, N. Y. Executive vice president: Charles R. Sligh Jr.

Dec. 7-9, Material Handling Institute Inc.: Annual meeting, Roosevelt Hotel, New York. Institute's address: 1 Gateway Center, Pittsburgh 22, Pa. Managing director: L. West Shea.

Dec. 8-10, American Nuclear Society: Winter meeting, Sheraton-Cadillac Hotel, Detroit. Society's address: Chicago 1, Ill. Executive secretary: Octave J. DuTemple.

Dec. 10-11, Industrial Truck Association: Annual meeting, Roosevelt Hotel, New York. Association's address: 526 Washington Loan & Trust Bldg., Washington 4, D. C. Managing director: William Van C. Brandt.

Dec. 12-14, Association of Steel Distributors Inc.: Annual meeting, Hotel Pierre, New York. Association's address: 29 Broadway, New York 6, N. Y. Counsel: Morris Rosoff.

Dec. 28-31, American Marketing Association: Winter meeting and exhibit, Morrison Hotel, Chicago. Association's address: 27 E. Monroe St., Chicago, Ill. Secretary: Schuyler F. Otteson.

1959

Jan. 14-16, American Management Association: Research and development conference, Roosevelt Hotel, New York. Association's address: 1515 Broadway, New York 36, N. Y. R&D division's manager: Philip Marvin.

Gas Fired, Oil Fired and Electrically Heated FURNACES
for these and other heat treating requirements

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EF engineers specialize in designing and building production furnaces—continuous and batch types—including roller hearth, roller rail, chain belt, wire belt, slot and tube conveyor types, reciprocating, rotary, car, bell, pit and other designs; complete with special atmosphere producers, and time and labor saving material handling equipment as required.

Reflecting more than 40 years of continuous research and experience, and outstanding engineering accomplishments, EF furnaces combine high heating efficiency, accurate automatically controlled cycles, and advanced designs that minimize maintenance, assure economy of operation, high hourly output and uniformity of product.

Submit your production furnace problems to experienced engineers—it pays.

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BULLETIN No. 461
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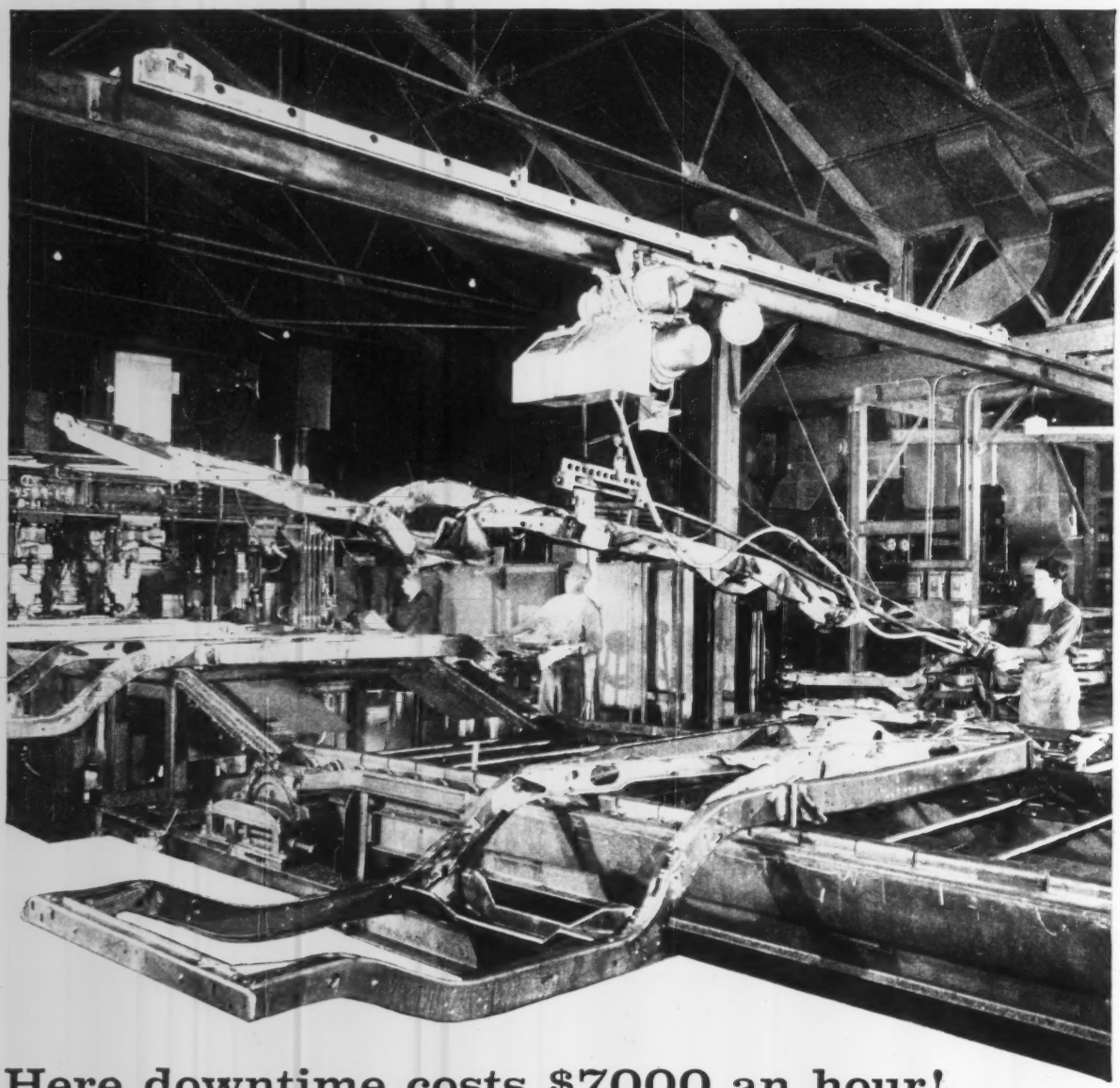


Here downtime costs $7000 an hour!

...so A. O. Smith uses P&H HOISTS to help prevent shutdowns

The stakes are too high to chance a breakdown on this auto frame assembly line at A. O. Smith Corp., Milwaukee, Wis. A. O. Smith production men reduce the risk by using trolley-mounted P&H Hevi-Lift Hoists, like the one shown above, for transfer operations.

A Hevi-Lift is virtually maintenance-free; P&H ingenuity has cut wear at the spot where more than half of hoist troubles occur — at the brake.

Only the Hevi-Lift has the new RCD brake. Of heavy-duty, mill-type construction RCD substitutes a gentle, but positive direct grip for the hammer action of old-fashioned brakes ... It has fewer parts to break down.

This is just one way Hevi-Lift helps cut the high cost of downtime every day in many industries. Ask your P&H distributor for a demonstration of the P&H Hevi-Lift in action! Dept. 204E, Harnischfeger Corp., Milwaukee 46, Wisconsin.

HARNISCHFEGER

P&H ... quality and service for 74 years

BUSINESS IS UNUSUALLY COMPETITIVE TODAY AS OPERATING COSTS ARE RISING AND PROFITS SHRINKING

Did you ever meet a vendor who wouldn't sell you the equipment you wanted?

Just "meeting" such a vendor is not enough.

If you haven't *always had* vendors who refuse to supply unsuitable equipment, you've been getting something you don't need.

If you haven't *always had* vendors who are dedicated to advancing your manufacturing technology, you're getting less than you *must* have.

Your responsibility for devising production processes and selecting equipment is greater than ever. You no longer have time to "hand-feed" any equipment builder's design and manufacturing operations.

Yet, you can't afford to install anything other than what is right. Because, if your production methods aren't keeping pace with your competitors', you're already starting to go out of business.

Sciaky knows these facts of business life. To Sciaky, it is obvious that the cost of always having to make *new sales to new customers* is far greater than the cost of a long term relationship of trust based on fulfilling your requirements. That's why Sciaky refuses to sell resistance welding and production equipment which is unsuitable for the user's needs.

Why take less than the full advantage of consulting with a Sciaky Application Engineer the next time you are considering equipment. No obligation, of course.

Many manufacturers are taking that advantage. As a result, men just like you are enjoying the full vendor support necessary to steadily improving their company's manufacturing operations. When Sciaky analysis of their requirements sometimes indicates that Sciaky equipment is not suitable, the recommendation for "no change" is immediate. Thus, Sciaky builds the foundation of trust necessary to your success.

The bulletin, "Resistance Welding At Work" contains many factual descriptions of interesting applications of the Sciaky technique. Write and advise of your field of interest.

SCIAKY®

67A

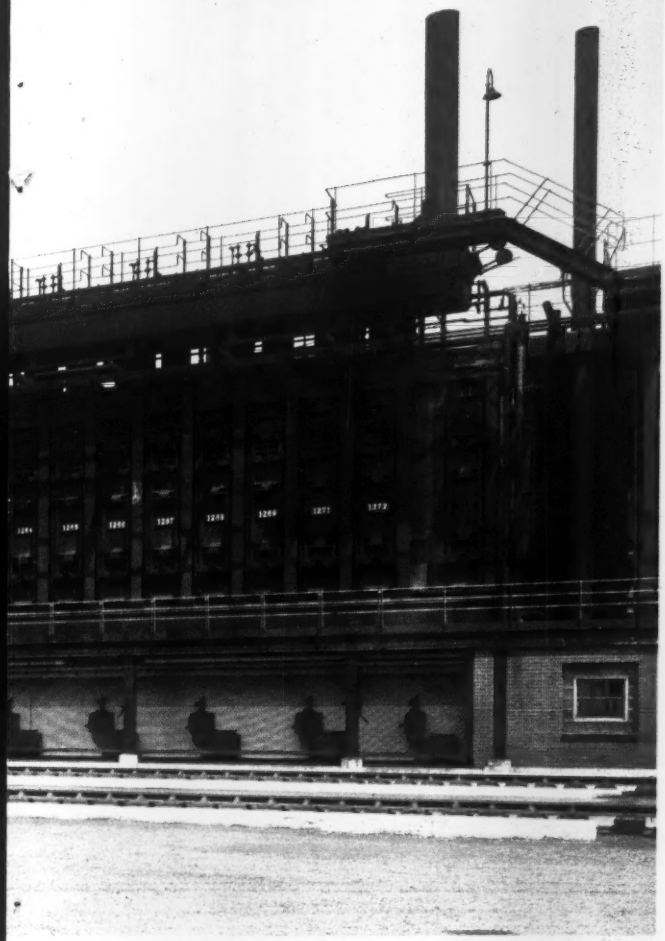
SCIAKY BROS., INC., 4909 W. 67th STREET, CHICAGO 38, ILLINOIS • POrtsmouth 7-5600

Eastern steel plant now has

65 NEW OVENS—These new ovens were furnished by Koppers, and were put into operation in June, 1957.

COAL HANDLING SYSTEM FOR THE COKE PLANT—Coal is conveyed to the breaker and balance building (center foreground), to the mixer and hammermill building, to the junction house (between stacks), and finally to the coal bin over the ovens.

12 coke oven batteries, 758 ovens . . . ALL designed and built by Koppers



SEVEN 385-TON OPEN-HEARTH FURNACES were designed by Koppers for this giant plant.

A giant Eastern Steel Plant recently put into operation a new battery of 65 Koppers-Becker Underjet Coke Ovens. This coke oven battery is the twelfth at this plant—*all designed and built by Koppers.* This battery is designed for underfiring with either blast furnace or coke oven gas. It has a daily coal carbonizing capacity of 1,450 net tons, and gives the plant a total carbonizing capacity in excess of 15,000 tons per day. To help supply the expanded coke plant, a new coal handling system was designed and installed by Koppers.

At this same plant, Koppers contributed further to the expansion of facilities by designing and supervising construction of a new open-hearth shop, and the installation of soaking pits and a 45″ by 90″ Universal slabbing mill.

Repeat Orders Signify Satisfied Customers. Since 1907 Koppers engineers have been working with coke ovens: reducing operating costs . . . increasing yield of chemicals . . . improving heating control. Koppers has built the majority of coke ovens in the United States. Most of this business, like the 12 batteries built for this Eastern Plant, has been repeat business—the kind you get only if your product has given satisfactory service.

Koppers coke plant layouts are engineered to fit individual requirements and to solve all coke plant problems dealing with coal preparation and handling, coal-chemical recovery, light oil purification and refining, phenol recovery, and associated processes. Koppers also welcomes repair and replacement work for coke ovens and auxiliaries.

If you want help or advice with any steel-plant expansion program, call on Koppers.

KOPPERS®

50 YEARS OF ENGINEERING AND CONSTRUCTION SERVICE
1908···1958

KOPPERS

SENSITIVE, RUGGED, VERSATILE—
TOPS FOR ALL-ROUND PRODUCTION

THE *ALL-NEW*
"BUFFALO" NO. 15 DRILL

The totally-new "Buffalo" No. 15 Drill combines brand new "easy-to-operate" features with the time-proven advantages earned by industry's choice for over twenty-five years.

The No. 15 has always been famous for its extreme sensitivity, which ideally suits it for small hole drilling. At the same time this versatile drill is sufficiently rigid and heavy to operate at full capacity without undue strain or wear.

New "Buffalo" No. 15 Drill Features Include:

- **Front-Mounted Start-Stop Switch.**
- **Easily-Read Speed Range Table.**
- **Graduated Depth Gauge.**
- **Proper Belt Tension is Automatically Maintained.**
- **Belt Guard Tilts Upward to Simplify Speed Changes.**

All these and many more notable improvements are yours with the new "Buffalo" No. 15 Drill. The No. 15 line includes bench, floor and pedestal models. Bench and pedestal types are available in 1- to 6-spindle models. Attachments for tapping, mortising, routing or spot-facing may be ordered.

Your nearby "Buffalo" machine tool dealer will be glad to arrange a demonstration of the No. 15 Drill. Contact him today, or write us direct for Bulletin No. 4024.

"Buffalo" products bring you the famous "Q" Factor — the built-in QUALITY which provides trouble-free satisfaction and long life.

ESTABLISHED 1877 "Buffalo" MEMBER N.M.T.B.A.

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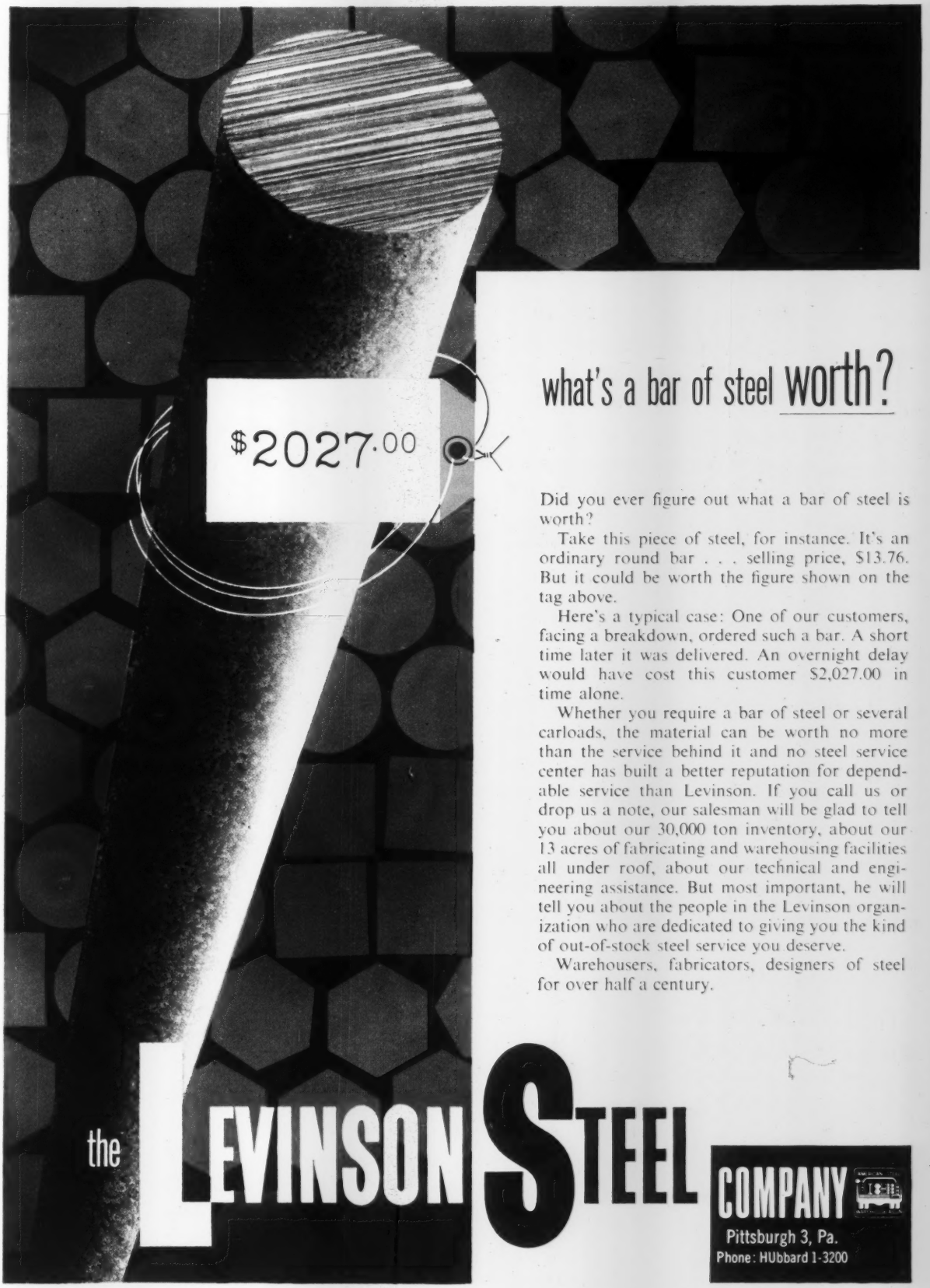


what's a bar of steel worth?

Did you ever figure out what a bar of steel is worth?

Take this piece of steel, for instance. It's an ordinary round bar . . . selling price, $13.76. But it could be worth the figure shown on the tag above.

Here's a typical case: One of our customers, facing a breakdown, ordered such a bar. A short time later it was delivered. An overnight delay would have cost this customer $2,027.00 in time alone.

Whether you require a bar of steel or several carloads, the material can be worth no more than the service behind it and no steel service center has built a better reputation for dependable service than Levinson. If you call us or drop us a note, our salesman will be glad to tell you about our 30,000 ton inventory, about our 13 acres of fabricating and warehousing facilities all under roof, about our technical and engineering assistance. But most important, he will tell you about the people in the Levinson organization who are dedicated to giving you the kind of out-of-stock steel service you deserve.

Warehousers, fabricators, designers of steel for over half a century.

the LEVINSON STEEL COMPANY

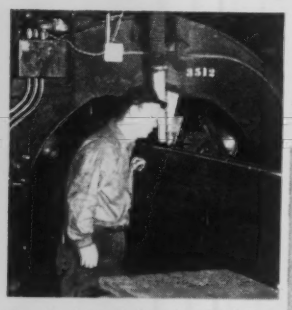
Pittsburgh 3, Pa.
Phone: HUbbard 1-3200

UNIONMELT Welding
makes short work of tall towers

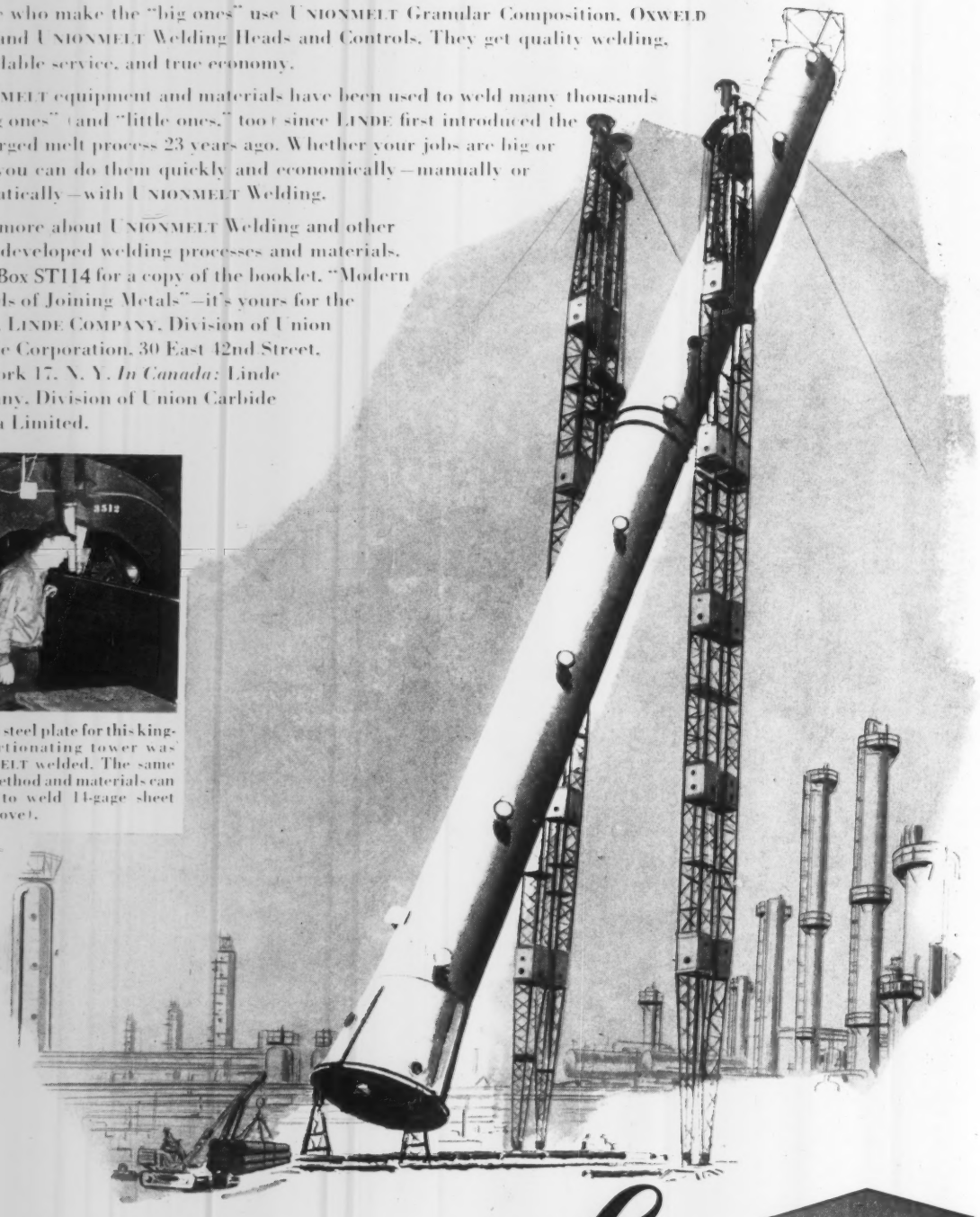
People who make the "big ones" use UNIONMELT Granular Composition, OXWELD Wire, and UNIONMELT Welding Heads and Controls. They get quality welding, dependable service, and true economy.

UNIONMELT equipment and materials have been used to weld many thousands of "big ones" (and "little ones," too) since LINDE first introduced the submerged melt process 23 years ago. Whether your jobs are big or little, you can do them quickly and economically—manually or automatically—with UNIONMELT Welding.

Learn more about UNIONMELT Welding and other LINDE-developed welding processes and materials. Write Box ST114 for a copy of the booklet, "Modern Methods of Joining Metals"—it's yours for the asking. LINDE COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y. *In Canada:* Linde Company, Division of Union Carbide Canada Limited.



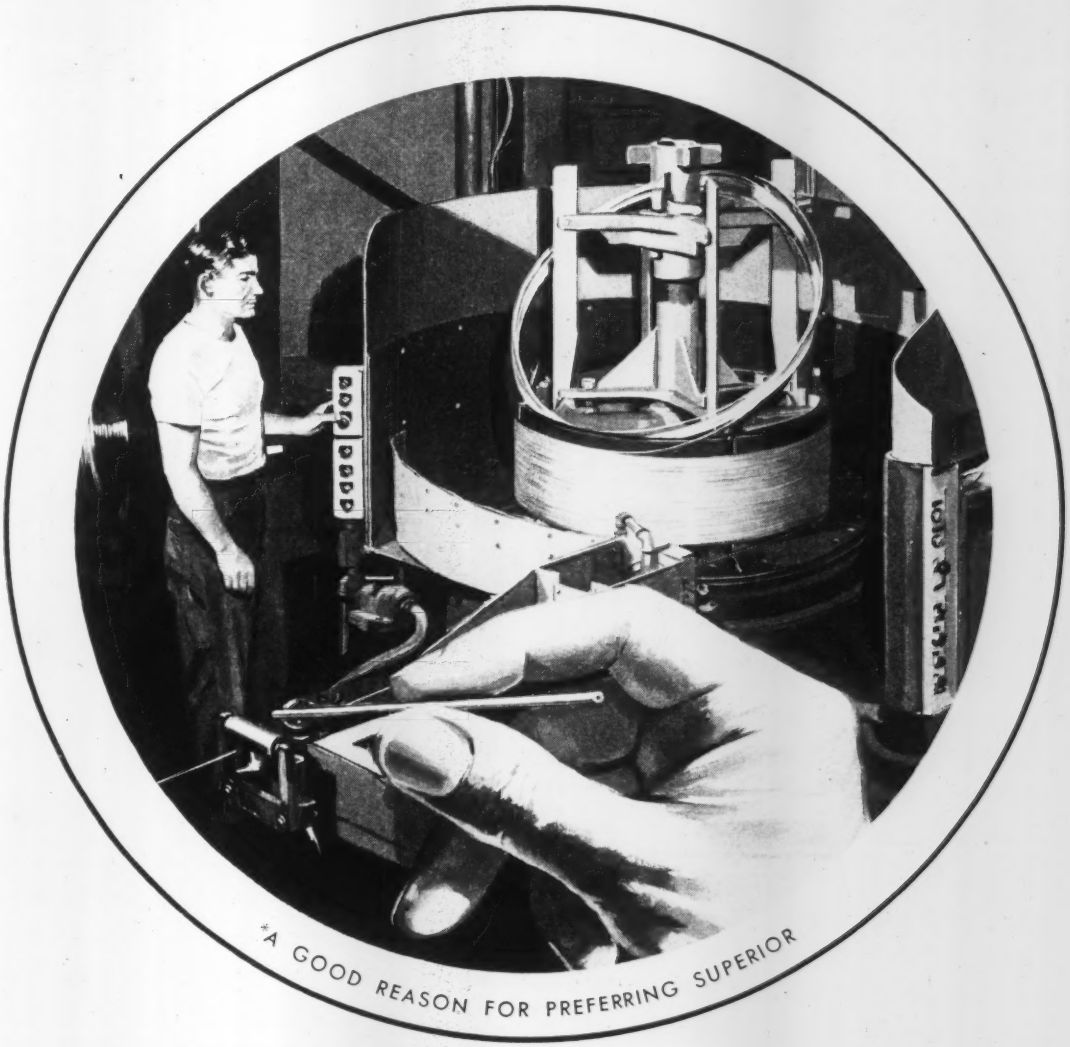
One-inch steel plate for this king-size fractionating tower was UNIONMELT welded. The same LINDE method and materials can be used to weld 14-gage sheet steel (above).



Linde

UNION CARBIDE

The terms "Linde," "Unionmelt," "Oxweld," and "Union Carbide" are registered trade-marks of Union Carbide Corporation.



New—capillary tubing in 3000 ft. lengths for industrial instrumentation

Improved bore uniformity, broader size range, flow tested to your specifications

To meet the demands of modern instrument design and automated fabrication, Superior is now offering seamless capillary tubing in lengths up to 3000 ft. It is available in nine different materials from select-quality raw stock, including stainless steel, carbon steel, nickel and nickel alloy.

Scrupulous care in manufacture results in a finished product that is bright and scalefree, with an extremely smooth, uniform bore. The tubing is easy to weld, braze or solder. ODs range up to $^{3}/_{16}$ in.—IDs from .004 to .040 in. maximum.

When you order capillary tubing by Superior you are assured that your specifications will be met. In addition to 100% dimensional, pressure and finish inspections, we also can test lengths for flow rates with the latest equipment when specified. Rates can be varied from 5 to 3700 cc per min.

More information on Superior's improved capillary tubing products is yours for the asking. Send coupon today.

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The big name in small tubing

NORRISTOWN, PA.

All analyses .010 in. to $^{1}/_{8}$ in. OD—certain analyses in light walls up to $2^{1}/_{2}$ in. OD

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2205 Germantown Ave., Norristown, Pa.
Send me a copy of new Data Memorandum 11, on capillary tubing.

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Burroughs' Unique Tests and Johnson Wire Build Quality, Long Life in Business Machines

Detroit Plant Develops Own Devices For 100% Tests of Music Wire Springs

Burroughs Corporation demands music spring wire as thin as a spider web's strand but with a minimum tensile strength of 439,000 pounds per square inch.

Then—to make sure it gets what it orders—the Detroit business machine manufacturer does 100 percent testing of all wire coming into its plants. Burroughs goes further than standard test equipment would permit and has developed its own special testing devices.

Burroughs' insistence on enforcing specifications is the kind of quality challenge on which Johnson Steel & Wire Company thrives. A customer's emphasis on quality wire complements Johnson's own skill and care given to producing the best in specialty fine wires.

Precision springs, made from Johnson Steel & Wire Company's music spring wire, get 100 percent testing on unique testing machines like this. Designed and built by Burroughs, this machine verifies a spring's load-carrying capacity at various extensions. If any modification is needed, correction can be made while spring is still on test device.

Johnson Steel & Wire has become Burroughs' major music spring wire supplier because Johnson's wire passes 100 percent inspection with flying colors.

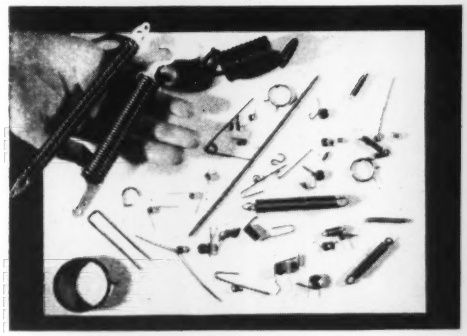
At Burroughs, where a monthly production of 3½ million precision springs of music wire is not unusual, close attention must be given to everything affecting performance of the finished spring. Failure of even the simplest spring could disable an adding machine, cash register, calculator or any of the dozens of different business machines Burroughs makes.

For its new machines, as well as service parts for older models, Burroughs makes 1,300 different kinds of springs. Music wire required for them ranges from .005-inches in diameter (with minimum tensile strength of 426,000 psi) to the largest diameter used—.106 inches in diameter, (with a minimum tensile of 268,000 psi).

Here's what Burroughs wants from music spring wire, in addition to tensile strength:

The coating, in the case of tin-coated music spring wire, must be uniform and adherent to eliminate peeling, cracking or flaking during coiling.

- **High physical qualities,** uniform cast and smooth, lustrous surfaces are another must so that uniform springs, within dimensions and capable of carrying assigned loads, can be produced.
- **Accuracy of dimensions** greatly affects spring coiling and spring performance. Burroughs' tolerance specifications are met consistently by Johnson's wire.
- **Straightness requirements** for pre-straightened wire call for a three-foot length of wire cut from a



Here's some of the approximately 1,300 different kinds of springs which Burroughs Corporation manufactures from Johnson Steel's music spring wire.

coil to be straight within 4 inches for .013-inch diameter wire and straight within 3 inches for wire .014-inch diameter and larger.

• **Coilability** is assured in the music spring wire Burroughs buys. Burroughs specifies that wire (.105 inch in diameter and smaller) must meet this test:

Wire is wound in a tightly closed spring to a coil length of 5 inches on an arbor 3 to 3½ times the diameter of the wire. When this spring is stretched so that it sets to 3 times its original length, the coils must show a uniform pitch with no splits or fractures in the wire.

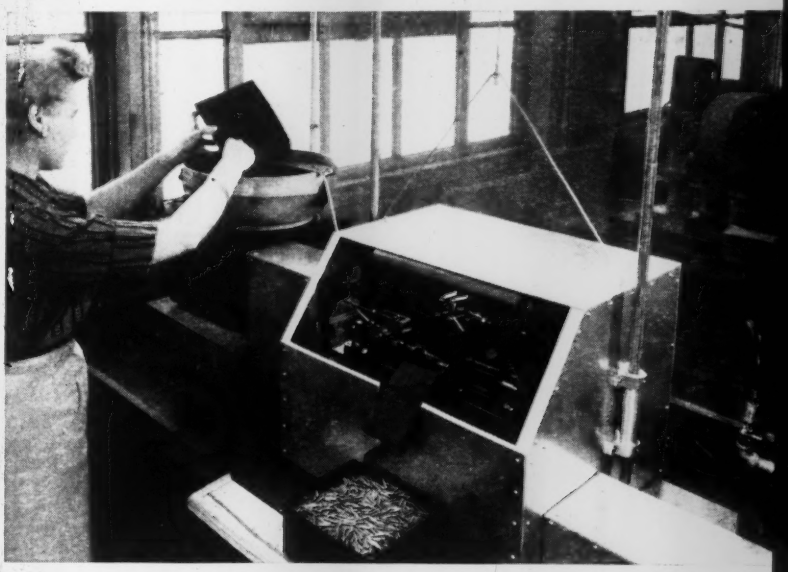
Testing completes the cycle which calls for highly skilled technicians coiling the best music spring wire available on the most modern equipment.

Testing machines, designed and built by Burroughs and used in addition to the standard machines, include the test fixture pictured here. This machine tests load-carrying capacity of springs. If any corrections are needed, they can be made while the spring is still on the test device.

Burroughs' careful attention to specs, its quality control and its testing procedure—plus its confidence in Johnson's music spring wire—are proof that Johnson can meet the toughest music wire demands.

Putting Johnson's music spring wire on your production lines starts benefiting you immediately. A corps of skilled wire engineers is as close as your telephone. Get in touch today with any of the district sales offices listed at right.

Several hundred music wire springs have been installed in this portable Burroughs adding machine. Every spring is critical, says Burroughs, because even the smallest spring failure could disable the machine.



This automatic spring eye-forming machine was designed and built by Burroughs personnel. An operator is shown filling the hopper with coiled springs which will be given an eye at each end on this device.

Johnson Steel & Wire Company, Inc.

Worcester 1, Massachusetts

a subsidiary of **Pittsburgh Steel Company**

Grant Building • Pittsburgh 30, Pa.

District Sales Offices

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COINING
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Automatically

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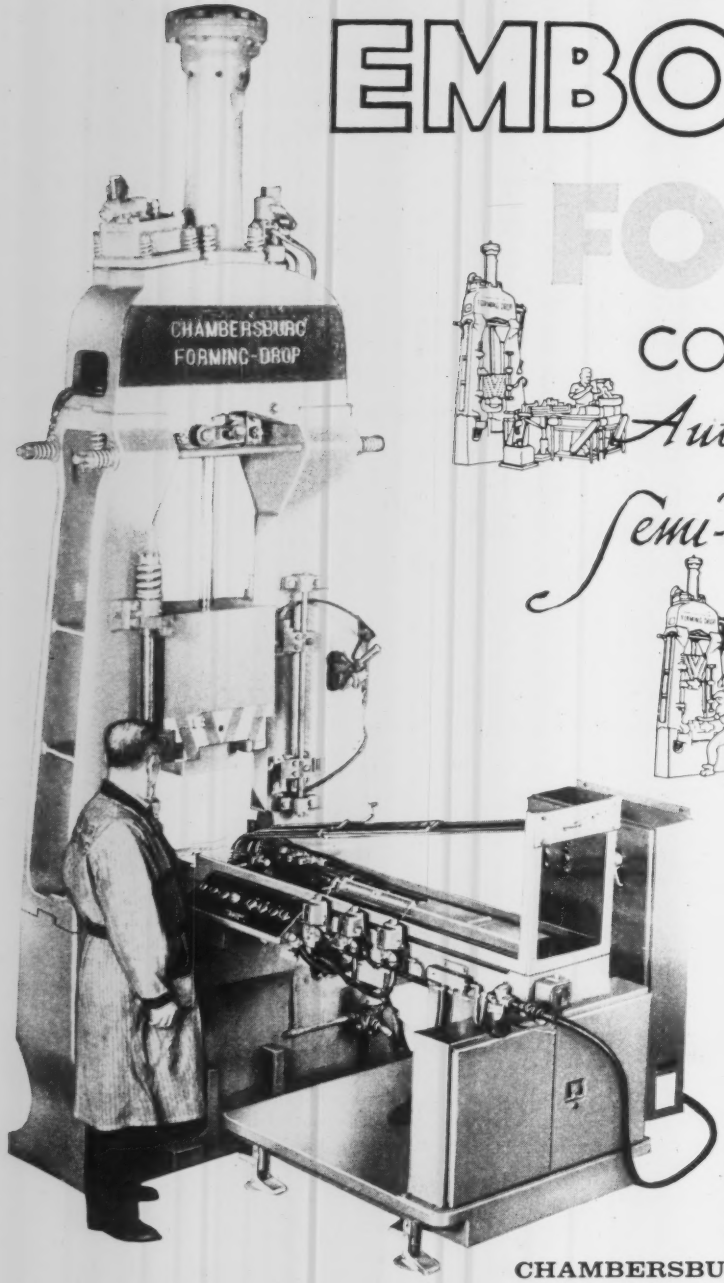


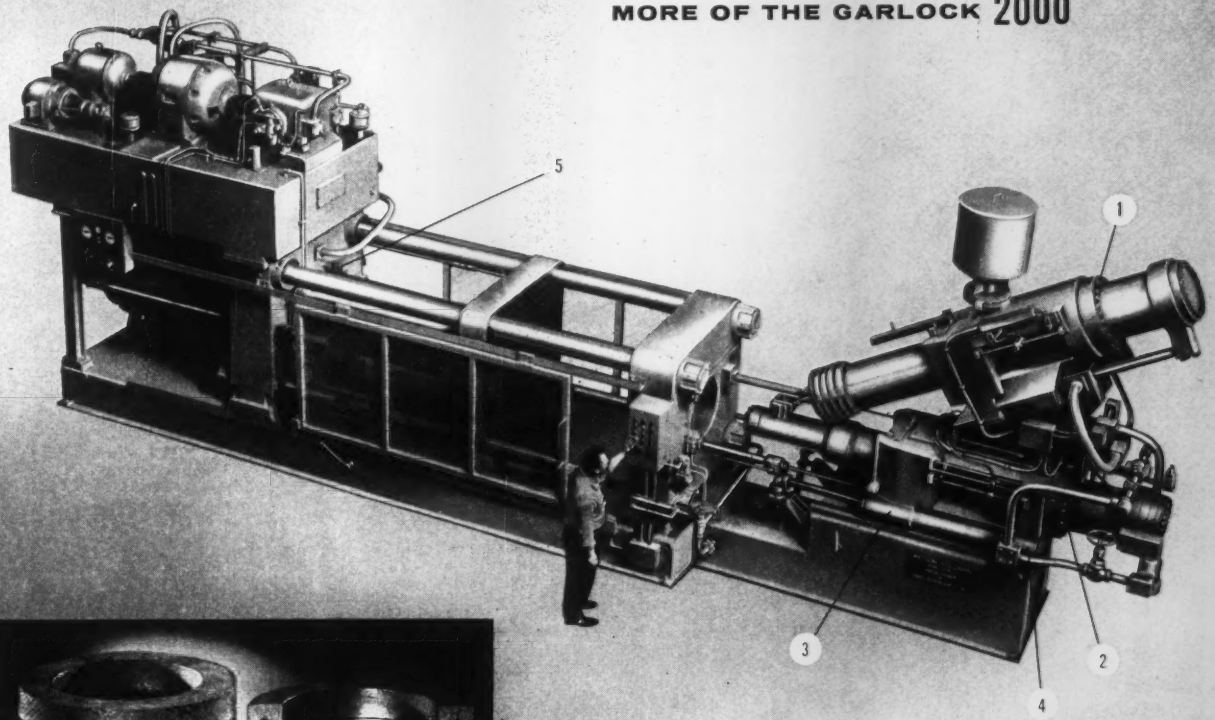
The new Chambersburg Forming Drop meets the demand for an accurate, high production hammer for coining, embossing, forming and cold striking. The impact blow, which minimizes springback, can be precisely adjusted to suit particular job requirements. Electric controls permit the use of versatile feed devices increasing operator safety and efficiency.

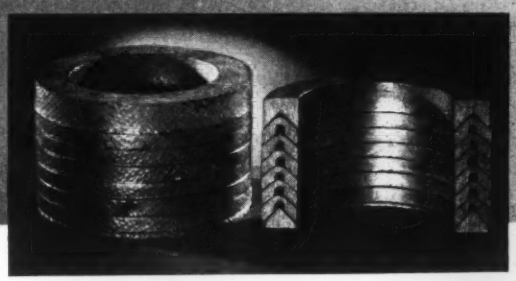
A Chambersburg representative will be glad to show you a film depicting this new production method. Phone or write for further details.

CHAMBERSBURG ENGINEERING COMPANY
CHAMBERSBURG, PA.

CHAMBERSBURG
FORMING DROP

MORE OF THE GARLOCK 2000





CHEVRON is used in stuffing box of (1) plasticizing ram, (2) shooting cylinder ram, (3 & 4) telescoping pipe connections, and (5) main clamping ram on mammoth plastics injection molding-machine made by Watson-Stillman Press Division of Farrell-Birmingham Co., Inc.

Garlock CHEVRON* Packings help achieve precision, efficiency in plastics molding . . .

WIDELY USED ON WATSON-STILLMAN'S complete line of plastics injection molding machines, Garlock CHEVRON Packings do an outstanding job sealing in hydraulic fluids and preventing loss of pressures. On pre-plasticizing ram, shooting cylinder ram, telescoping pipe connections and on main clamping ram, they help maintain 3000 psi pressures and prevent leakage of oils important in the precision molding of freezer compartments, battery cases, radio and TV cases, and large, deep-drawn pieces.

THERE ARE MANY REASONS why Watson-Stillman chooses Garlock to do these jobs. CHEVRON Packings have an exclusive hinge-like construction which permits free operation with a minimum of friction. As pressure increases, CHEVRON tightens to prevent leakage. As pressure declines, the packings ease off, resulting in unobstructed movement of the ram or piston without leakage. This means that, once initial gland adjustment is made, no further regulation is necessary to compensate for pressure change. CHEVRON Packings can be applied against practically any lubricants, liquids, or solvents—at high or low pressures—and at temperatures to +500° F.

CHEVRON PACKINGS are an important part of "the Garlock 2,000" . . . two thousand different styles of packings, gaskets, and seals for every need. The only complete line. See your local Garlock representative, or write for Folder AD-115. *Registered Trade Mark

THE GARLOCK PACKING COMPANY, PALMYRA, N. Y.

For Prompt Service, contact one of our 30 sales offices and warehouses throughout the U.S. and Canada.

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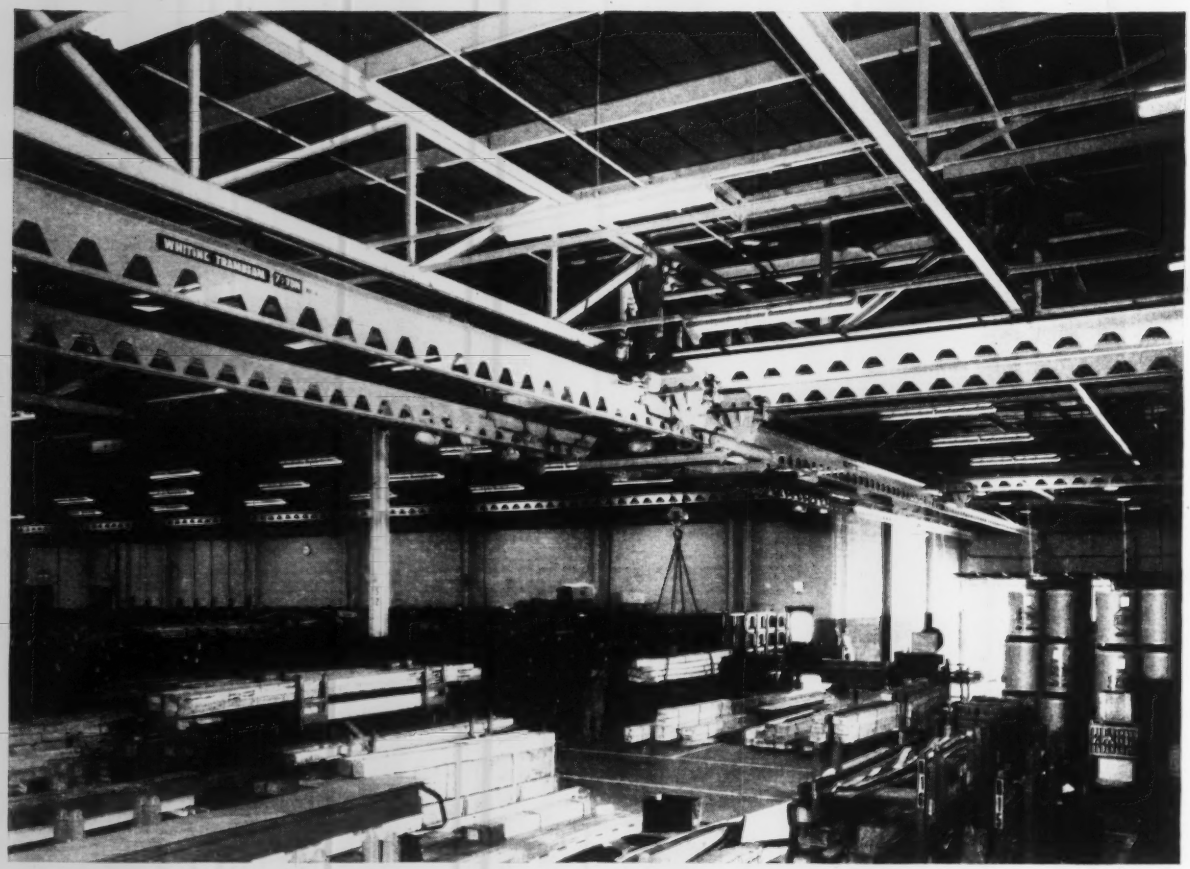
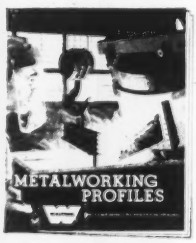


How overhead handling saves space

Automatic Electric, winner of an award for one of 1957's best ten new plants, uses Whiting Trambeam Overhead Materials Handling Systems. A Trambeam Crane System moves finished products from packaging and crating area to temporary storage in the shipping room. Result: aisle space is minimized – total cubic space is more effectively utilized.

In the receiving and storage areas four 7½-ton Trambeam cranes run on 660-foot runways to move as much as five million pounds of raw materials per month to communications equipment production lines, efficiently and economically. Additional Trambeam Systems help the plating and other departments to maintain high-gear production. Find out how *your* plant can boost production, cut operating costs, and make full use of floor and overhead space with a Trambeam Overhead Materials Handling System. Get the facts today.

SEND FOR "METALWORKING PROFILES"



the big, colorful new booklet showing performance reports of Whiting products on the job . . . bringing new efficiency and economy to materials handling operations. Ask for booklet 242. *Whiting Corporation, 15613 Lathrop Avenue, Harvey, Illinois.*

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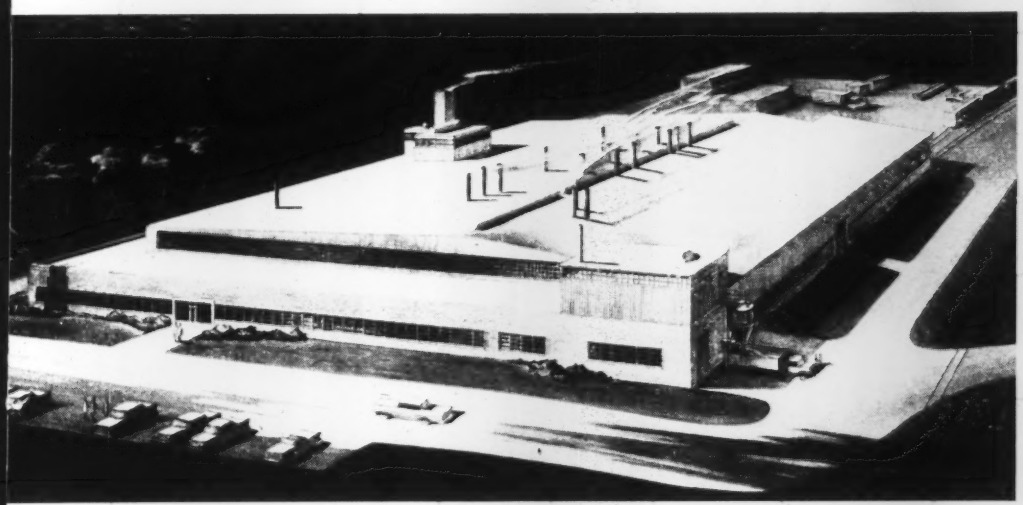
TRAMBEAM

MANUFACTURERS OF CRANES; TRAMBEAM HANDLING SYSTEMS; TRACKMOBILES; FOUNDRY, RAILROAD, AND CHEMICAL PROCESSING EQUIPMENT

Now producing . . . Federated quality aluminum casting alloys from the world's most modern aluminum smelter. New convenience, faster service from the new Alton, Illinois plant and the same rigid quality controls that distinguish all Federated products. This modern smelter can produce every specification of aluminum alloy. And Federated field metallurgists back up every shipment of Alton aluminum ingot with on-the-spot assistance based on long experience. For a broad choice of aluminum casting alloys, call your nearest Federated sales office. There are 23 of them to serve you promptly. Federated Metals Division, 120 Broadway, New York 5. In Canada: Federated Metals Canada, Ltd., Toronto and Montreal.

FEDERATED METALS DIVISION OF



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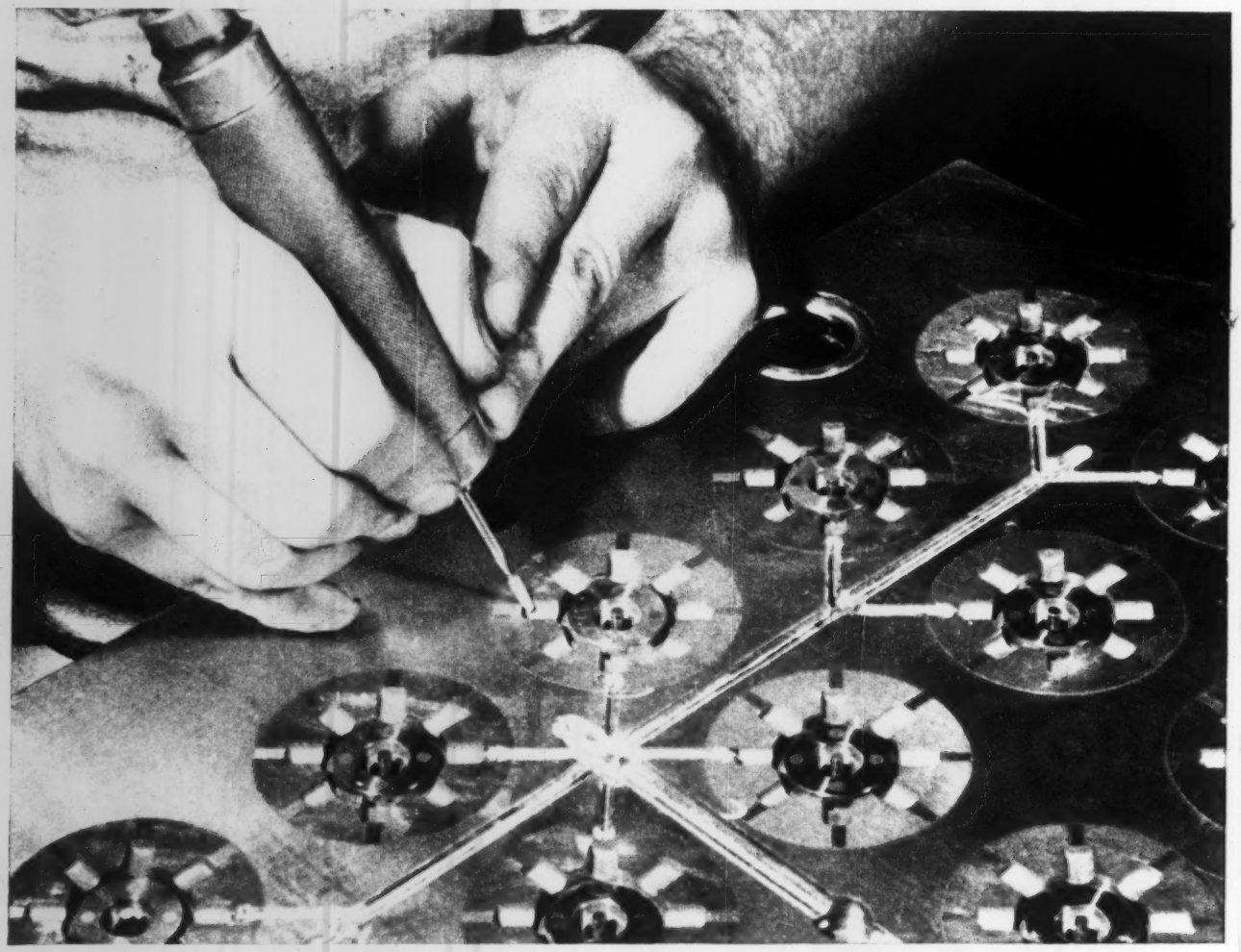
AMERICAN SMELTING AND REFINING COMPANY

32 ALUNDUM Abrasive for your tool and die jobs*



Here's how Norton keeps

"Making better products... to make your products better"

Our motto is constantly being proved by our customers. Norton mounted wheels, for example, are hitting new highs in grinding efficiency. Outstanding new developments in abrasives and wheel construction eliminate loading and glazing, assuring best possible results in:

TOOL AND DIE GRINDING

Norton mounted wheels with sharp 32 ALUNDUM abrasive and VBE bond are the very best performers.

Advantages: Wheels need no costly dressing, hold form and give constant cutting action from start to finish — right down to the mandrel. "Best I ever had," reports a long experienced die finisher.

ROUGH GRINDING

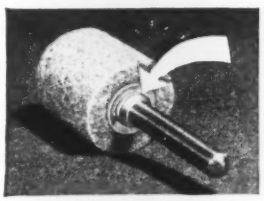
For steel castings and weldments, mounted wheels of tough 44 ALUNDUM abrasive with VBE bond, and metal-mounted, are unequalled.

For snagging cast iron, wheels of sharp 32 ALUNDUM abrasive with VBE bond, and metal-mounted, outperform silicon carbide wheels consistently.

Advantages: Norton wheels give you the fastest cutting rate, with a marked increase of stock removed per wheel. "There has never been anything like them for speed and economy in our snagging," says the foreman of a leading foundry.

32 or 44 ALUNDUM Abrasive for your rough grinding

METAL-MOUNTING — *Another Norton Exclusive* — *You throw nothing away but the mandrel!*



Norton does it again! The mounted wheels are so securely anchored to the mandrel — *you use all of the abrasive!* No waste . . . all work! This radically improved method of locking the abrasive body to the mandrel is used on mounted wheels in most sizes and shapes, 5/16" diameter and larger. Molten metal, injected into the abrasive recess at high pressure, does it — and does it fine!

Every Norton mounted wheel is accurately trued *after mounting* on rust-proof stainless steel mandrels. Developed to increase the time-and-money-saving "Touch of Gold," Norton mounted wheels are stocked in approximately 200 standard shapes and sizes. See your Norton Distributor for prompt deliveries. Or write to NORTON COMPANY, General Offices, Worcester 6, Mass. Plants and distributors around the world.

*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

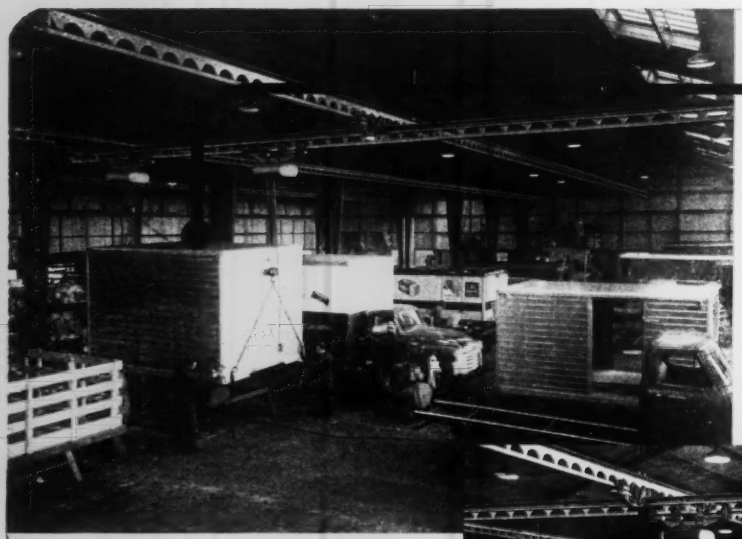
NORTON
ABRASIVES

W-1879

Making better products . . . to make your products better

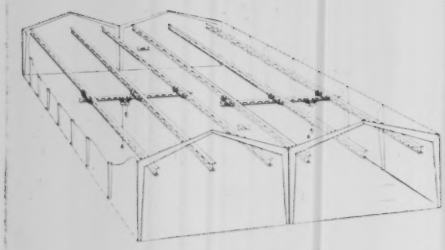
NORTON PRODUCTS Abrasives • Grinding Wheels • Grinding Machines • Refractories • Electrochemicals — **BEHR-MANNING DIVISION** Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes

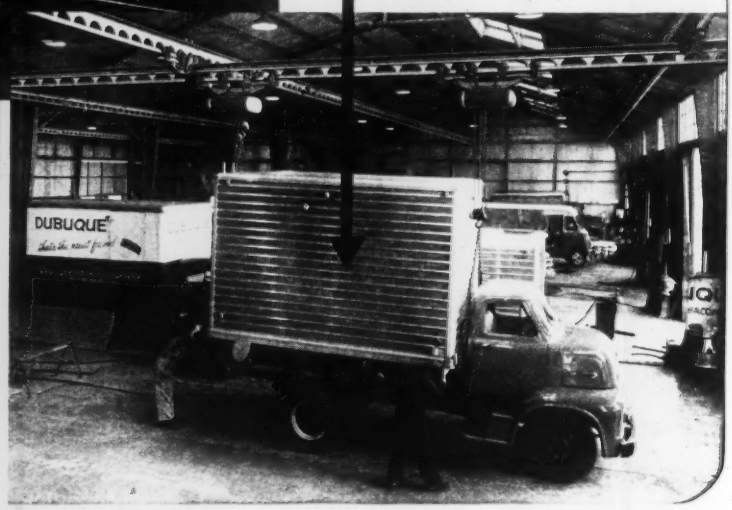
TRAMRAIL TRANSFER CRANES
SPEED BODY WORK



From Here
Fast-Easy-Safe
To Here

Crane runways are three-track type, 180'-0" long and 19'-0" above floor. Cranes are hand-propelled and 54'-10" overall. Power is supplied to electric hoists by Safpowrbar conductors.





TRUCK and trailer bodies are big, heavy and awkward to handle. It takes considerable time to move them from one point to another by ordinary means. With an overhead Cleveland Tramrail transfer crane system, however, the work is made simple, easy and fast.

C & C Trailer & Body Co., Oakland, California, erected a plant consisting of two prefabricated Soule Steel buildings assembled together, side by side. A 3-ton, 3-runway transfer crane was installed in each. Two cross-over spurs were provided, permitting a load being transferred from one crane to the other. Bodies, or other loads, can therefore be picked up at any point in the entire plant and delivered directly to any other point.

The smooth rolling cranes are always ready to provide handling service any place in the plant. They eliminate a great deal of unnecessary motion. Handling time is reduced and production speeded, resulting in lower costs.

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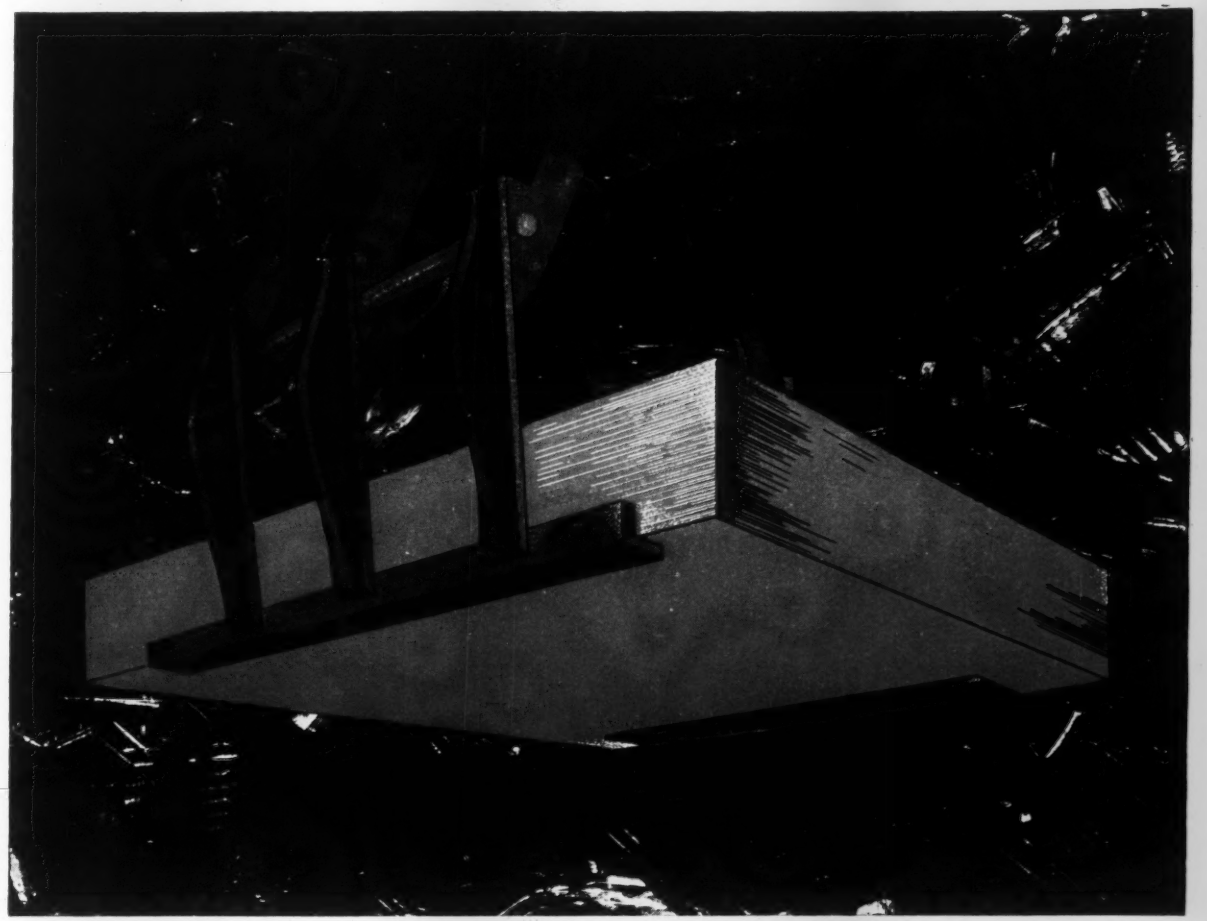
THE CLEVELAND CRANE & ENGINEERING CO.
7808 East 290th Street, Wickliffe, Ohio

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT



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Steel service centers stock USS Hot-Rolled, Cold-Rolled, Galvanized, Galvannealed and Paintbond Sheets, and USS Hot-Rolled Strip.

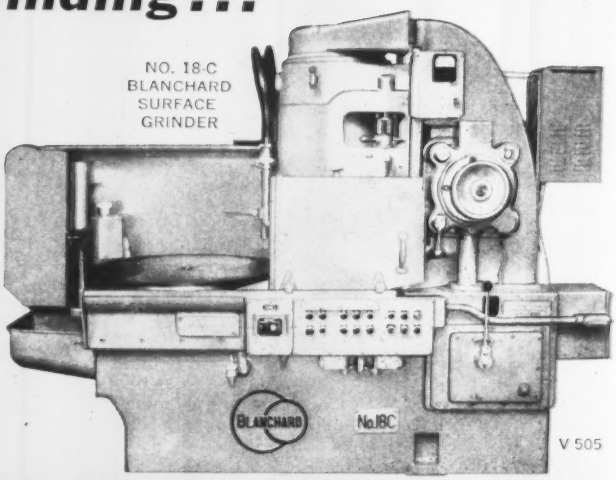
Remember, as a part of the American Steel Warehouse Association, your steel service center has been set up specifically to handle your immediate steel demands. So the next time you order steel sheet and strip from your steel service center, be sure to specify *USS Sheet and Strip.* *USS is a registered trademark*

USS United States Steel

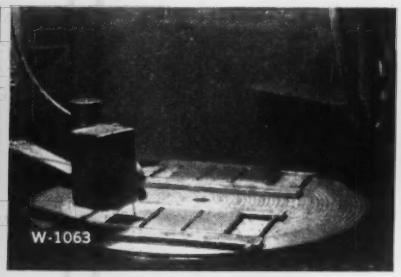
AMERICAN STEEL WAREHOUSE ASS'N.

For better, easier grinding...

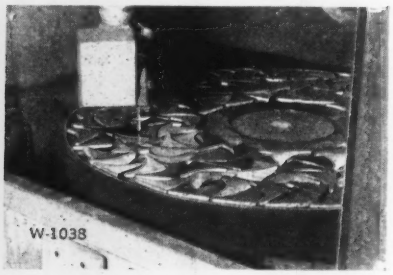
Whether you're "hogging" off stock from rough castings or precision grinding to a tolerance of ±.0005", you can do it better and easier with the Blanchard No. 18-C Surface Grinder. Once the work is set up, the automatic cycle handles every operation from start to finish. The operator is free to prepare the next load of work or to operate a second No. 18-C Grinder.



Cast Iron Plate. Blanchard ground at the rate of 30 pieces – 60 surfaces – per hour. Stock removal ⅛" each side.



Steel Bars. Blanchard ground at the rate of 48 pieces – 192 surfaces – per hour. Stock .040"-.045" from each side. Limits ±.001" square, flat and parallel.



Hot Rolled Steel Cams. One operator and one No. 18-C Blanchard produce 225 pieces – 450 surfaces – per hour. Stock removal 1/32" each side. Limits ±.001".

just push a button...

- Automatic size control to ±.0005"
- Duplication of repetitive loads
- Pre-set "spark out" time for flatness and surface finish
- No more "operator worry" on close work – greatly reduced fatigue
- A large part of operator's time available for
  - (a) Handling or slushing work pieces
  - (b) Filing burrs
  - (c) Selecting correct wheel and preparing for next job
- Specially-designed sizing device with built-in feature to compensate – automatically – for wheel wear during grinding cycle.

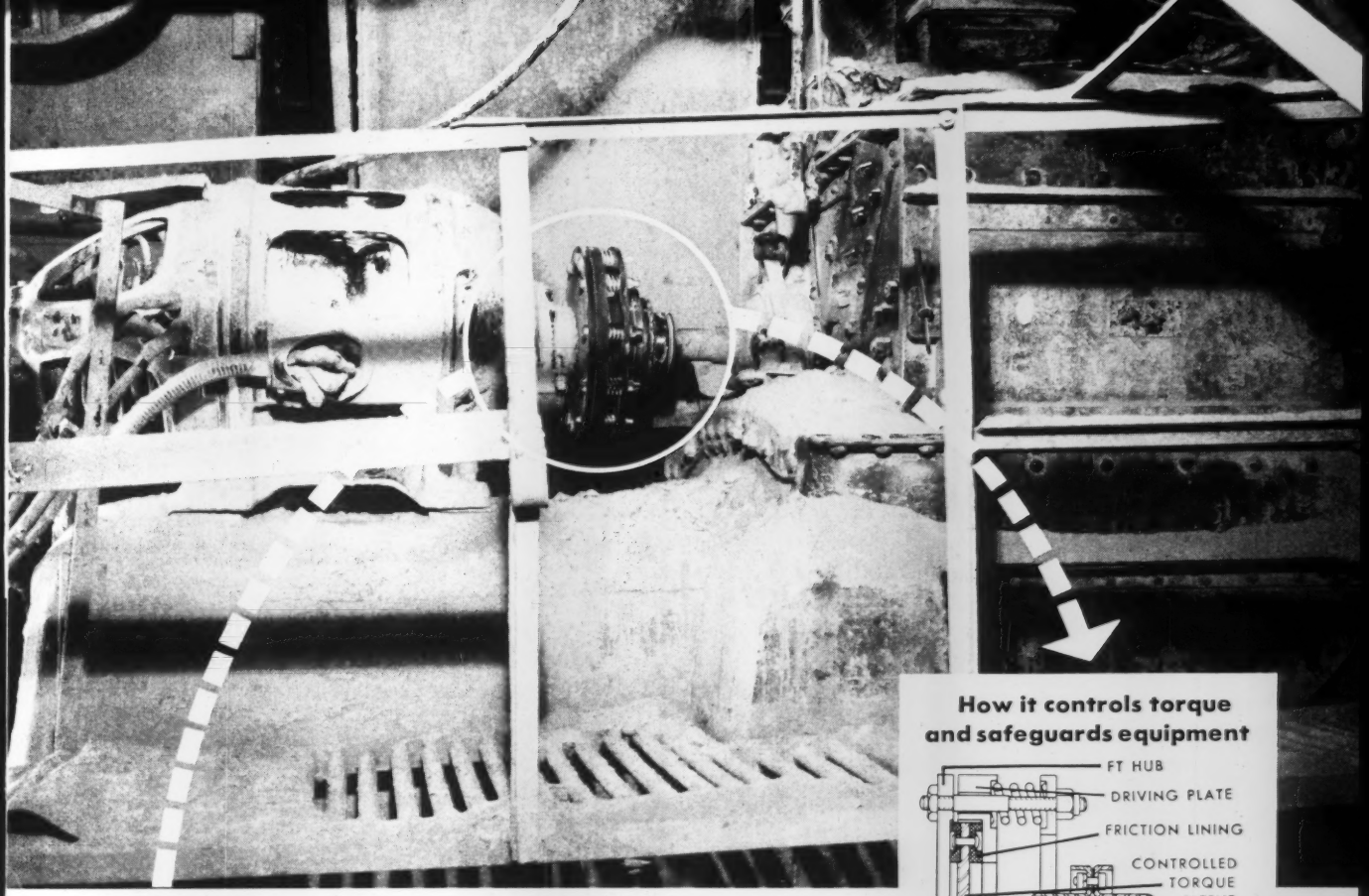
All of these features give you *more efficiency at reduced costs!*

PUT IT ON THE BLANCHARD

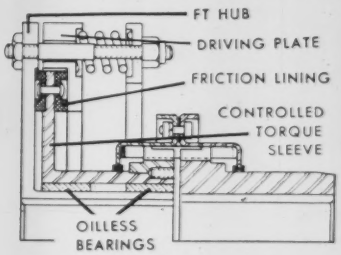
Send for your free copy of Model 18-C folder.

THE BLANCHARD MACHINE COMPANY

64 STATE ST., CAMBRIDGE 39, MASS., U. S. A.



How it controls torque and safeguards equipment



Protect machines from overload damage with FALK Controlled Torque Couplings

The above picture shows a Falk Controlled Torque Coupling connecting a 150 hp motor to a hammermill. Formerly, when tramp iron got into the mill, it was necessary to rewind the motor at least twice a year. But, in the 2½ years after installing a Falk Controlled Torque Coupling, no motor repairs were required. *That is real saving!*

Wherever overload danger exists, a Falk Controlled Torque Coupling gives positive protection against machinery damage from excessive torque or jams. This unique coupling has an adjustable friction slip clutch which can be set at *any* predetermined torque limit. Thus, transmission of dangerous shocks is prevented...overloads are limited...shaft breakage is eliminated.

Another big advantage is that, when the cause of the overload is removed, the entire coupling will rotate and transmit power without resetting, and *without replacing parts or repairing the coupling*....And, the Controlled Torque Coupling incorporates the famous Falk Steelflex torsional resilience to smother ordinary shock and vibration, plus the ability to accommodate shaft misalignment....Consult your Falk Representative or Authorized Falk Distributor. **Ask for Bulletin 4100.**

Here (as in photo), the torque-control hub is shown mounted on driving shaft. From this hub, power is transmitted through friction lining to controlled torque sleeve. Load to be transmitted is determined by the (pre-set) pressure on friction lining. In case of overload, this hub still rotates until power is shut off—but the rest of the coupling and the driven machine will slow down or stop.

Motor Shut-off Control

By adding an automatic cut-out switch with V-belt connection to driven shaft, motor can be stopped immediately. With the standard hub mounted on driven shaft, the switch opens the electric circuit when speed of switch falls below predetermined value.

THE FALK CORPORATION, MILWAUKEE 1, WISCONSIN

MANUFACTURERS OF QUALITY GEAR DRIVES AND FLEXIBLE SHAFT COUPLINGS

Representatives and Distributors in many principal cities.

FALK

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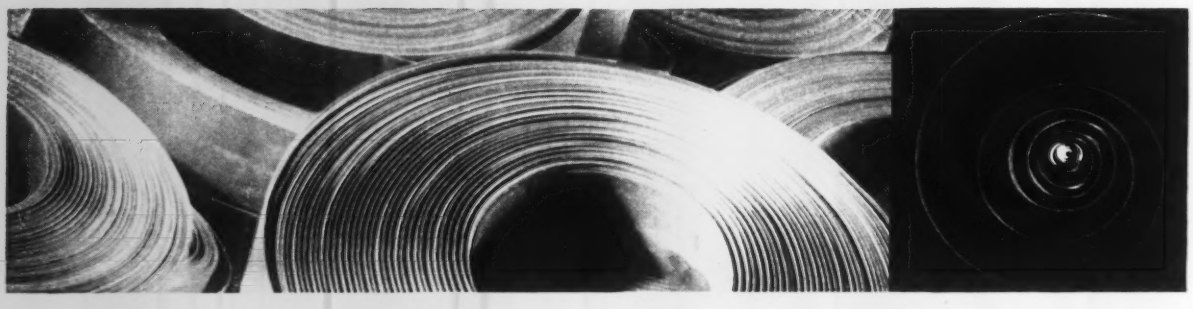
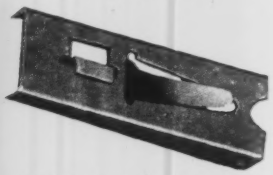


How they're using

Wallace Barnes Cold-rolled Specialty Steels

1. *In Three Drawing Stations*

The part shown in illustration one was made from .59 – .74% carbon steel in three drawing stations. From .70 – .80% carbon, this piece should have four or five drawing stations. The piece could be made from .90 – 1.05% carbon, but would require seven drawing stations with fully annealed steel.

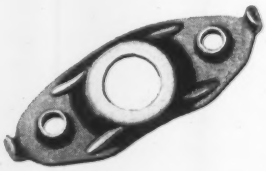


2. *Blanked on 45° Angle*

The stamping shown in the second illustration was made from .70 – .80% carbon spring steel. It was blanked and pierced on a 45° angle, with small holes pierced to prevent fracture in later forming and bending. It was then given severe secondary forming. The small tab shows "orange peel" and probable fracture would occur if the part were formed from .90 – 1.05% carbon.

3. *All Flanging One Operation*

Our third part is a gun stamping made from .70 – .80% carbon with a sharp bend with the grain in one stroke of the press. Higher carbon will fracture due to its less ductile qualities.



4. *Thirteen Steps Progressive*

The fastener shown in the fourth illustration was made from the .59 – .74% carbon steel, the only spring steel which would take the bends and draws to which it is subjected here. All the higher carbon steels were rejected because they failed under the cold-work necessary to produce the two small extrusions. It took seven reductions to bring these extrusions within tolerance. There were thirteen steps total in the progressive die.

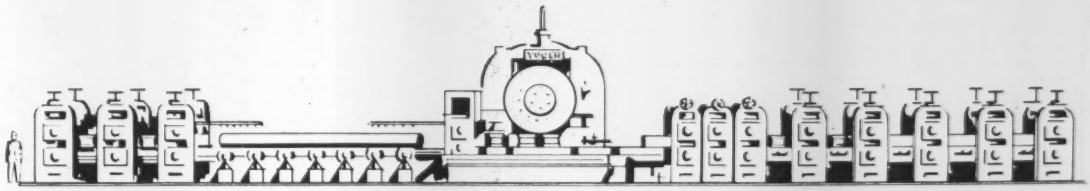
These examples show how proper steel selection may save operations and insure satisfactory performance. Among the many sizes and types of Wallace Barnes cold-rolled specialty steels is the right one for your application. Send for "Physical Property Charts" giving tensile strength and forming properties of Wallace Barnes tempered steels.

Wallace Barnes Steel Division

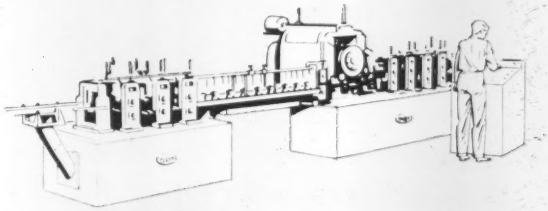
Bristol, Connecticut

Associated Spring Corporation

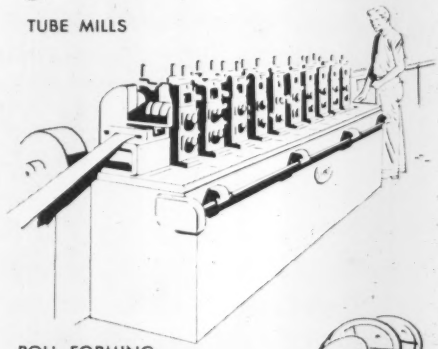
5808



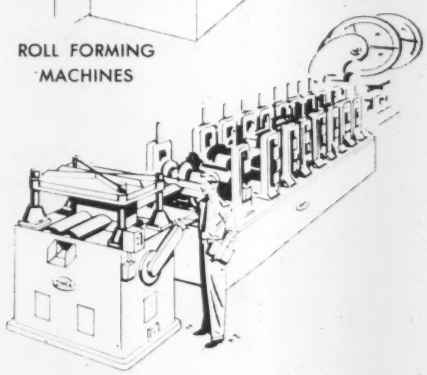
PIPE MILLS



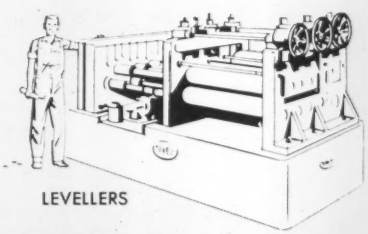
TUBE MILLS



ROLL FORMING MACHINES



CUT-OFFS



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Special attachments and auxiliary units can perform additional operations such as welding, coiling, punching or embossing without extra labor cost while increasing production speed.

Let Yoder engineering and "know-how" help you get the most from your plant . . . with Yoder equipment. For full details, write to:

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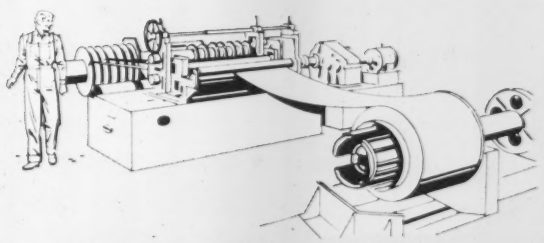

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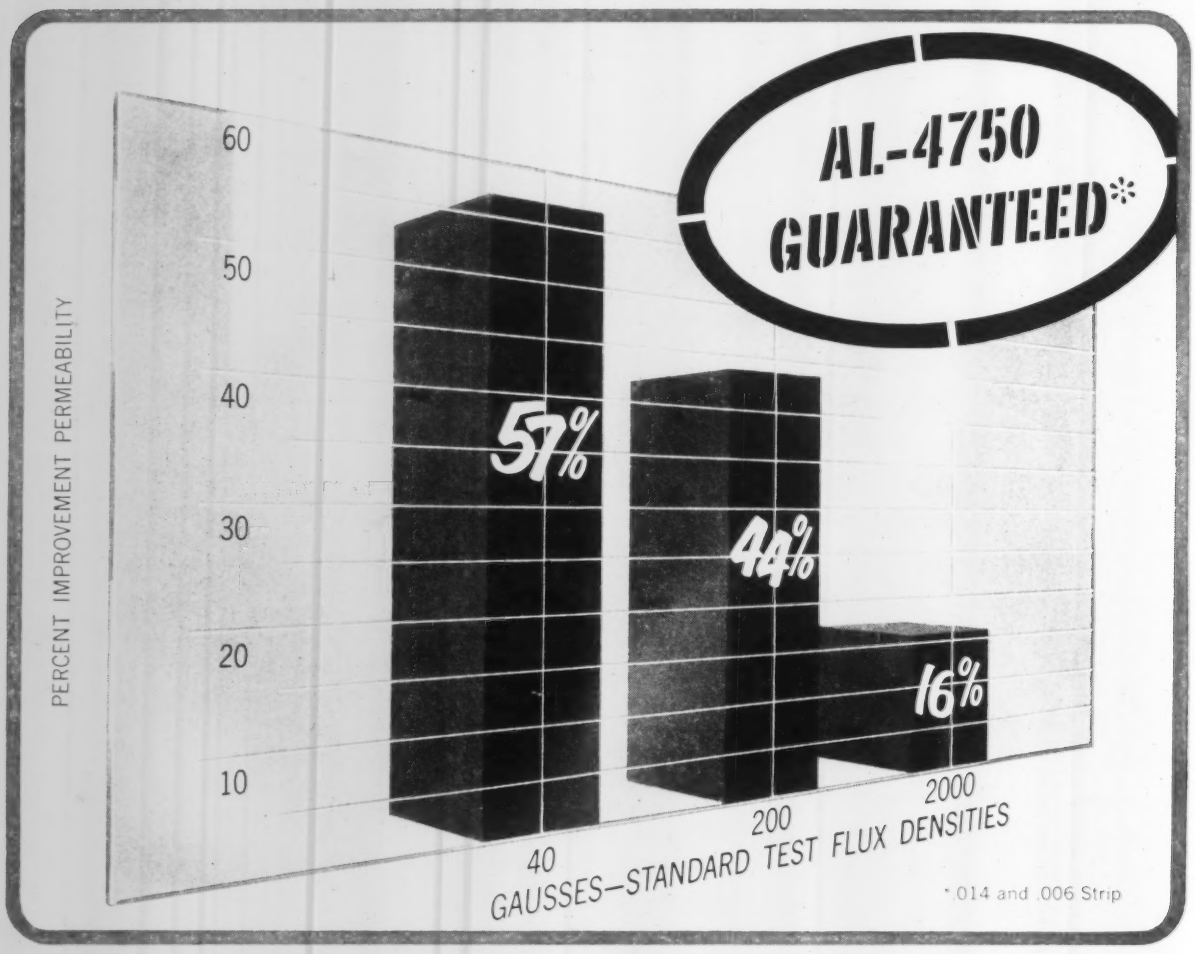

GUARANTEED PERMEABILITY... and at higher values than old average values in AL-4750

AL-4750 nickel-iron strip now has higher permeability values than ever before . . . and the new, higher values are guaranteed. For example, using the standard flux density test, at 40 induction gausses, AL-4750 now has 57% higher permeability than in the past. And permeability values are guaranteed.

This guaranteed permeability means greater consistency and better predictability for magnetic core performance . . . permits careful, high performance design.

The improvement in AL-4750 didn't just happen. It is the result of Allegheny's electrical alloy research and production program in nickel-bearing steels. A similar improvement has been made in AL Moly Permalloy. And research is continuing on silicon steels including AL's famous Silectron (grain oriented silicon steel), as well as on other magnetic alloys.

Another service of Allegheny Ludlum includes complete facilities for the fabrication and heat treatment of laminations. Years of experience in AL's lamination department means that Allegheny Ludlum has encountered and solved most problems common to core materials. This practical know-how is available to all. Call us for prompt technical assistance. Write for blue sheet EM-16 for complete data on AL-4750.

Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pa. Address Dept. S-111.

WSW 7269

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Stuart

Productive Lubrication

FOR PROFIT-MINDED PRODUCTION MEN

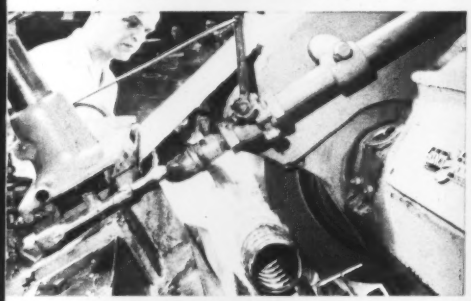
VOL. 1, NO. 1 NOVEMBER 1958

High-lubricity soluble oil helps Bower grind better bearings faster

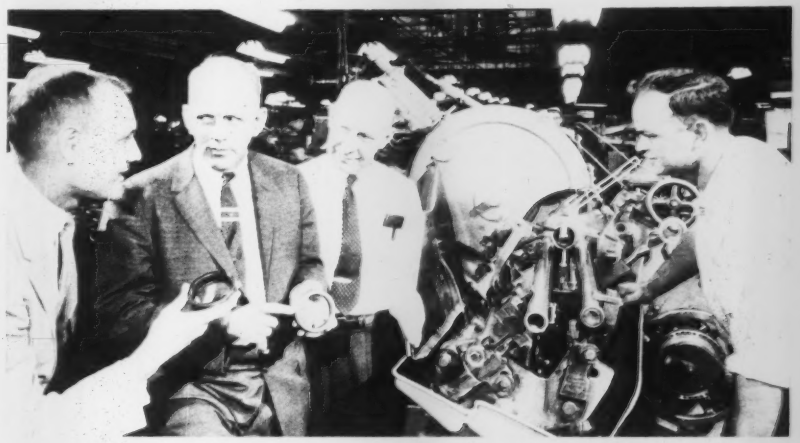
Stuart's free-cutting Dasco super soluble hikes production. Fine finish trims honing time.

Experience at Bower Roller Bearing Division, Detroit, proves some interesting points about cutting fluids for grinding 52100 steel.

Stuart's Dasco super soluble base is used in Bower's central system at 30:1 for grinding cups and cones for all types of tapered and straight roller bearings. It helps attain surface finishes up to 20 microinches, reducing the amount of honing required. In addition, Dasco super soluble contributes other important advantages: decreased cycle time per piece, reduction in annoyance



of rancidity, and longer solution life than with other cutting fluids tested. Vapor and dirt are reduced.



Stuart's John S. Dalton, with Spike Dunaway, general grinding foreman, and William Hoff, both of Bower, solved a difficult grinding problem on tough bearing steel with Dasco super soluble base.

Answer to Stress-Free-Grinding

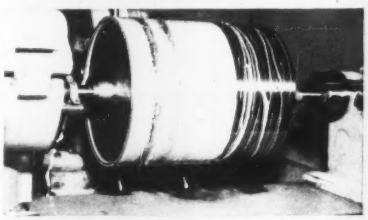
Tolerances at Bower as close as .0005 in. on both OD and ID are not unusual and even closer limits are required on some jobs. Extra-high detergency and free-cutting action are just as vital as cooling to prevent heat-checking, loss of accuracy due to heat distortion, and costly downtime for wheel dressing. Wheel grits vary from 60 to 120, and some wheels may cut up to 1000 pieces before dressing.

Excellent Automation Cutting Fluid

In this shop, which works two-shift operation, Dasco super soluble helps increase production when used in a central system serving over 100 different grinding machines because downtime for maintenance, clean-out, and recharging the machines is at a minimum.

Dasco super soluble base is a compound formulated for metal-working operations too difficult for ordinary water-mix fluids, yet not suited for straight cutting oils. It has a sulphochlorinated fatty oil base, which provides an excellent combination of antiweld and lubricating properties for turning, drilling, milling, sawing, boring, and reaming.

CODOL proves versatile on fine-finish job



Finish grinding IBM's all-important "memory unit" (above) dramatically illustrates the versatility of Stuart's Codol liquid grinding compound. The 10-in. OD monel drum rotor is coated with copper and final-plated with a cobalt-nickel outside coating that retains and categorizes all information from the data-processing machine. Dirt, scratches, or dimensional inaccuracies could cause serious errors. Each coating is precision ground using Stuart's Codol to lubricate and keep the wheel clean. About .008 in. is removed in each step, and concentricity is held within .00025 in. Codol's extreme cleanliness is most important, followed by cooling efficiency, and carefully balanced surface tension that floats away "chips" to prevent scratches.

MORE PL FACTS ▶

Stuart

Productive Lubrication

Low tool lubrication cost a danger signal

Any cost which looks low and stays low could be a "booby trap" and should be re-evaluated periodically by production management.

This does not imply that a higher cost for a cutting fluid necessarily gives you the best combination of qualities for a particular job. Sometimes the low-priced product outperforms the higher priced product. But, there is a basic fallacy in purchasing and budgeting practice today which often defeats your purpose of profitable operation, particularly with today's lower volumes. Here's what we mean.

In a very few instances can a cutting fluid be considered a machine maintenance item, or cost, or an overhead burden to be allocated by department in relation to its consumption. If the cutting fluid doesn't protect the cutting tool, you're better off machining your pieceparts dry.

Thus, "tool lubrication cost" is as integral a part of tool replacement cost as the cutting tools, resharpening, and downtime for changing and resetting tools.

COST (per week)	Cutting Fluid "A"	Cutting Fluid "B"
1. Tool changing cost	$ 1.20	$ .30
2. Tool regrinding cost	$239.40	$59.85
3. Tool depreciation cost	$145.00	$36.25
4. Tool lubrication cost	$ 1.77	$ 1.89
Total tool replacement cost	$387.37	$98.29
1. Tool replacement cost per piece	$ .32	$ .08
2. Machining cost per piece	$ .24	$ .20

Determine your tool lubrication cost per piece (along with your other tool replacement costs) and you will find it so small that only performance really counts.

Cost of cutting fluid is not always in the price. Here's why. In one case studied, a 12c a gallon "higher price" increased the number of pieces per sharpening 300%, reducing the average number of tool regrinds 75%, and the number of new tools required was reduced 95%. This improvement cut tool replacement cost from $387.37 to $98.29 per week—all for an added expenditure of just 12c a gallon for an improved type of cutting fluid.

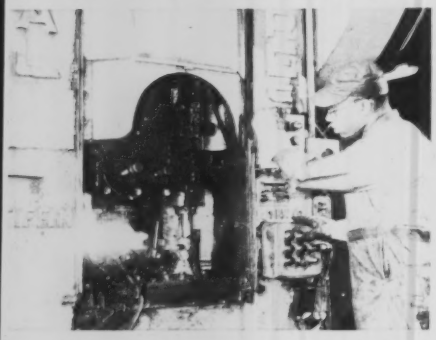
An annual increased investment of $6.24 to get an improved quality product yielded a yearly saving of $15,032.16.

The chart illustrates the economies inherent in cutting fluid evaluation. On this job with tool replacement cost reduced from 32c to 8c per piece, the manufacturer could afford to increase machine speed from 720 to 980 ft per min. The part cost was slashed from 56c to 28c — a 50 per cent cost reduction.

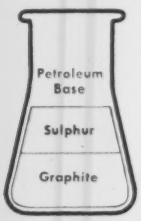
Advantages of THERMEX compounds stand out on tough valve forging job

High lubricity solves galling and welding problems, low burning rate protects operator

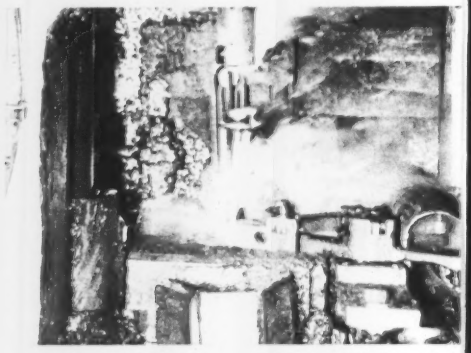
Galling and welding are eliminated in the plant of one of the automotive Big 3 by using a spray application of Stuart's Thermex "CMF"



forging compound to produce 3800 exhaust valves per eight-hour shift with manual load and unload and 10,000 V-8 intake valves per shift automatically. Out of a full-shift production of over 38,000 exhaust valves, only 3.7 per cent were rejected. On another run of 24,260 valves, rejects were only 2.25 per cent, and on a third run of 15,893 V-8 valves, rejects dropped to 1.55 per cent.



The plant's general superintendent reports Thermex "CMF" has a lower burning rate after the initial flash, making it ideally suited for insert die valve forging . . . particularly on the automatic machines



operating at 40 per cent greater stroke capacity. Other forging compounds burned with increased intensity or continuity, creating difficult working conditions.

The answer is a high graphite content in the lubricant. Thermex "CMF" has a high percentage of graphite, contains active sulphur to eliminate galling and welding, and provides efficient lubrication under the high temperature operating conditions of this forging operation.

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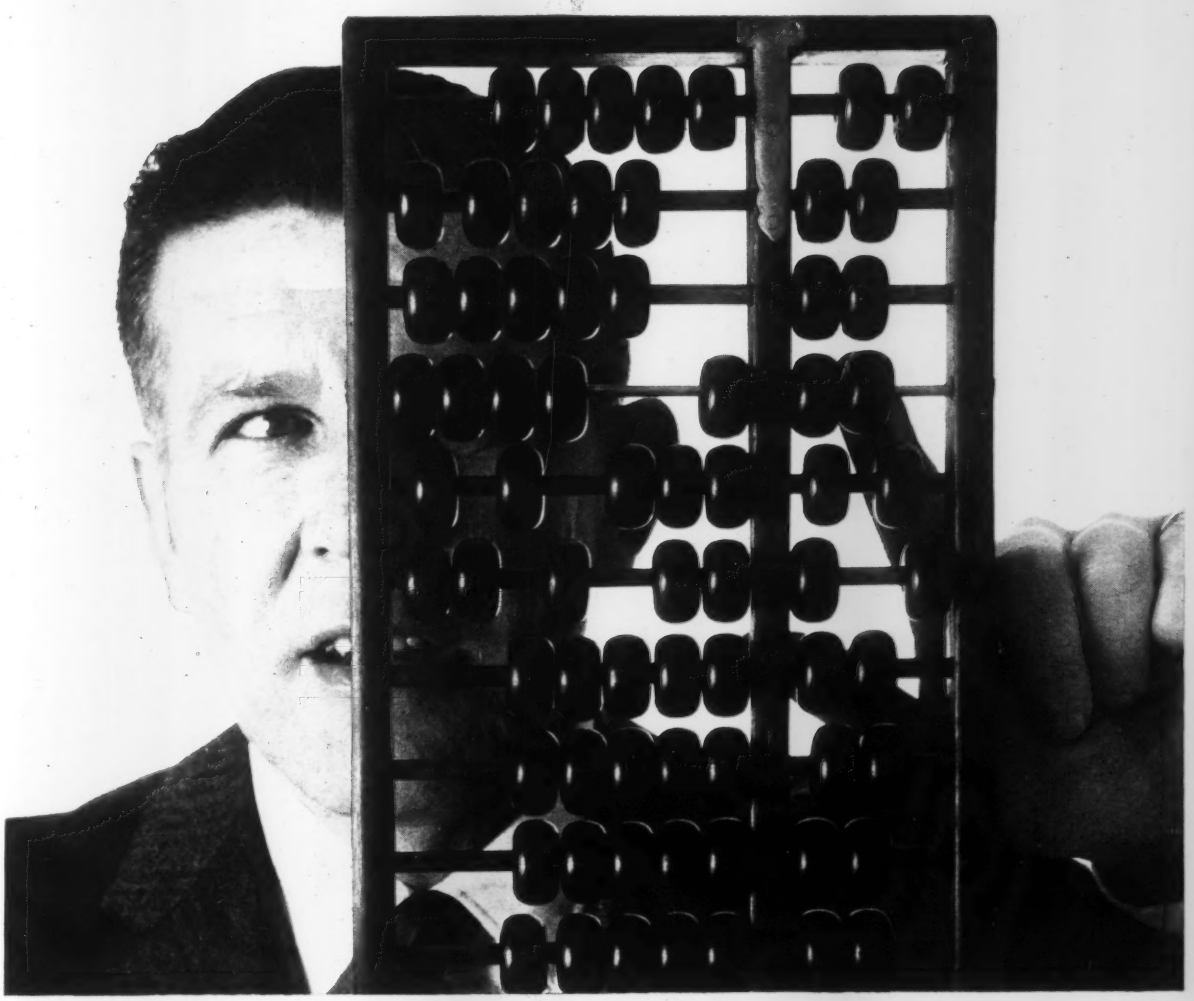


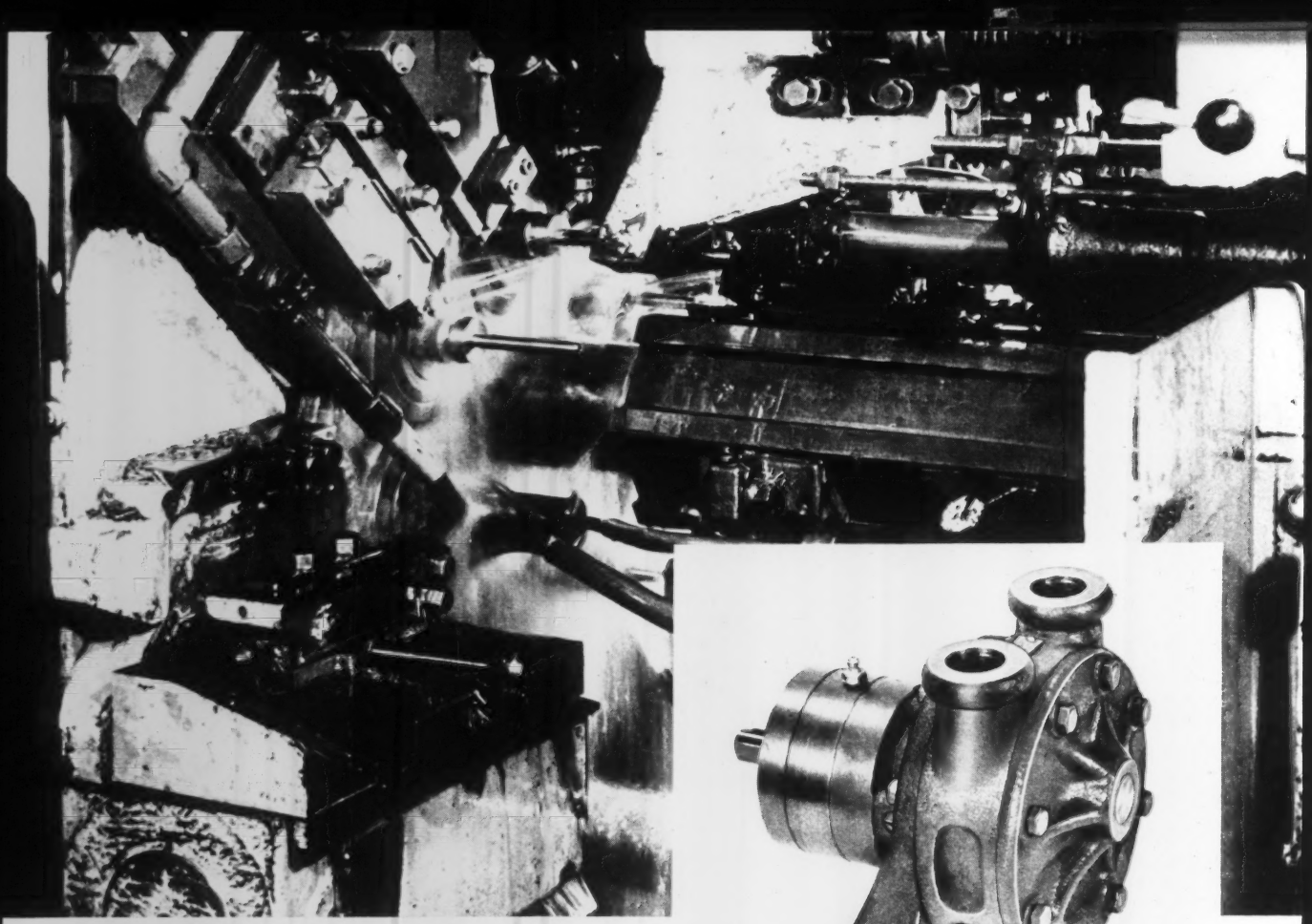
According to our latest count, we make exactly 12,347 sizes of FEDERAL BALL BEARINGS!

Our vice president in charge of counting things (A. Bacus, by name), has just handed us this bit of intelligence with a quiet look of satisfaction. And well he might. These 12,347 ball bearing sizes (including hundreds of types) can answer almost any application call made by modern industry. And some of the companies that consistently call for Federal Ball Bearings include General Electric, International Harvester, Goodyear Aircraft, Cutler Hammer, American Bosch-Arma, and scores of others. Names that you know and trust have put *their* trust in Federal Ball Bearings.

When Federal Ball Bearings are part of so many things you *use*, shouldn't they be part of the things you *make?*

THE FEDERAL BEARINGS CO., INC. • POUGHKEEPSIE, NEW YORK

Federal **Ball Bearings** *One of America's Largest Ball Bearing Manufacturers*



NO DILUTION PROBLEM with cutting oil on automatic screw machines at Tuthill Pump Co. Cleartex lubricates machine as well as cutting surface, speeds production of equipment like Tuthill Model CK pump (right).

No cutting oil dilution for 10 years in Tuthill's automatics—thanks to Cleartex

Texaco Cleartex is the dual-purpose oil that eliminates cutting oil dilution on automatic screw machines. Ever since Tuthill Pump Co., Chicago, started using Cleartex in 1948, they have been able to report complete elimination of the dilution problem, as well as increased production and longer tool life between regrinds.

Cleartex solved Tuthill's cutting oil problem by combining in one product a fine cutting oil *and* a premium lubricant. The combination of high stability; rust protection and relatively high extreme-pressure properties makes Cleartex a top performer in both categories.

There is a complete line of Texaco Cutting, Grinding and Soluble Oils. A Texaco Lubrication Engineer will gladly help you select the proper ones for your operation. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)

STEEL

November 24, 1958

Metalworking Outlook

U. S. Steel's Cliff Hood To Be 65 in February

Clifford F. Hood, president of U. S. Steel Corp., will become 65 on Feb. 8, 1959. That's the normal age for corporation executives to retire, but there's no hard-and-fast rule. Look for Mr. Hood to hold the reins until the corporation's next major problem is solved—the 1959 labor negotiations. That means he'll be on the job at least until next July 1. Within the confines of Pittsburgh's Golden Triangle you hear a lot of speculation on who his successor will be.

The Corporation's Negotiating Team

Odds are that a pair of men will be presenting U. S. Steel's case to the United Steelworkers when the all-important labor negotiations start next spring. R. Conrad Cooper, executive vice president-personnel, will have overall direction of the corporation's strategy. R. H. Larry, administration vice president, will probably handle face-to-face negotiations with the union.

Labor's Election Wins Give Pause

Labor's victories at the polls are giving steel industry strategists pause. But look for a tough management line when parleys begin with the union. U. S. Steel's Mr. Cooper has a reputation for firmness. Inferences in speeches and other public remarks of several top industry executives all point to a hard line. Other side: Steelworker President David J. McDonald has repeatedly said that his union's demands will be high. He has had troubles with his membership and needs a favorable settlement for political reasons.

The Rarick Rebellion's Aftermath

Nick Mamula, president of United Steel Worker Local 1211 at Jones & Laughlin Steel Corp.'s Aliquippa Works, has been charged with "dual unionism." The action follows an Atlantic City resolution (Sept. 18) that instructed locals to bring their leaders to trial. The action by the union convention was aimed at Mr. Mamula, Frank O'Brien, president of Local 1843, and Don Rarick, president of Local 2227, all leaders in a rebellion against President McDonald. Look for similar charges against Messrs. O'Brien and Rarick. Two other rebels—Anthony Tomko, president, and Edward Galka, vice president, Local 1408—have already been tried and exonerated.

Wanted: $20 Billion for Steel

The major problem facing the steel industry over the next two decades in the opinion of C. M. White, chairman of Republic Steel Corp.: How to raise the $20 billion needed to pay for the increased steel capacity which our growing population will demand. Assuming for computation purposes

Technical Outlook—Page 99 Market Outlook—Page 133

that rising steel plant costs will stabilize at $350 per ton of new capacity over the next 20 years. Mr. White figures the $20 billion cost on the basis of the industry building an average of 3 million tons of new steel capacity a year for the next 20.

Alcoa Steps Up Research

As if you didn't already know it, aluminum producers plan continued growth through the replacement of other materials. Edward B. Wilber, vice president and treasurer of Aluminum Co. of America, says that increased research is part of the strategy. Alcoa spent $15.8 million on research and development in 1957, then boosted the figure to $18 million this year despite the recession. The company has acquired a 2000-acre tract near Pittsburgh where it will build a campus-type research center. Cost: $30 million.

Trouble in Plastics

Even the zooming plastics industry is troubled with oversupply this year. It will produce 2.2 million tons in 1958, vs. 2,167,057 last year. G. L. Pitzer, vice president-production of Union Carbide Plastics Co., calls overcapacity "the heart of the industry's present problem." Result: The molding industry's net (after all taxes) this year will be less than 2 per cent.

Nuclear Power After 1975?

All powerplants built after 1975 will be nuclear, predicts Dr. John Turkevich, chemistry professor at Princeton University. In England, where fossil fuels are running out much faster than they are in this country, the cutoff date for nonnuclear plants will probably be 1965. Dr. Turkevich believes the switch will come even sooner in India and other underdeveloped areas.

Income Tax Reduction?

Individual and corporate income taxes should be reduced over a five-year period to a minimum of 15 per cent and a top of 40 per cent. That's the belief of Lothair Teetor, former assistant secretary of commerce who is a director and part owner of Perfect Circle Corp., Hagerstown, Ind. The reduction, he says, would stimulate the economy to such an extent that the total tax take would not be changed.

Straws in the Wind

United Mine Worker President John L. Lewis may terminate the soft coal pact Dec. 1, thus setting a strike deadline for Feb. 1. . . . The 83-day strike by United Steelworkers against Steel Co. of Canada Ltd. has ended. The contract, which runs to August, 1961, grants wage increases averaging 26 cents an hour; Stelco's pact is 2 cents higher than the one negotiated earlier with Algoma Steel Corp., but rates at the two companies are now about equal.

"WEIRKOTE'S ZINC COATING STAYS SKINTIGHT. NO PEELING OR FLAKING—CAN ELIMINATE DIPPING OR PLATING AFTER FABRICATION!"

Q. Sure, but what happens on the tough jobs—like deep drawing or crimping?

A. You can work Weirkote right to the limit of the steel itself. And as I said, no peeling or flaking.

Q. Then where's the miracle? We tried galvanized before. And it struck out. Too much trouble, too much cost fixing it up after fabrication.

A. No miracle. It's just that Weirkote's made by the continuous process which integrates zinc and steel so that the toughest fabrication won't break down the bond.

Q. That means then that Weirkote can eliminate the need for plating or dipping to assure uniform corrosion protection for the most intricate part . . . is that the picture?

A. Yes, that's exactly the picture . . . and with Weirkote you can free a lot of the capital, floor space and time you have tied up in plating operations.

Send today for free booklet that details the time- and cost-saving advantages of using skintight zinc-coated Weirkote. Write Weirton Steel Company, Dept. B-8, Weirton, West Virginia.

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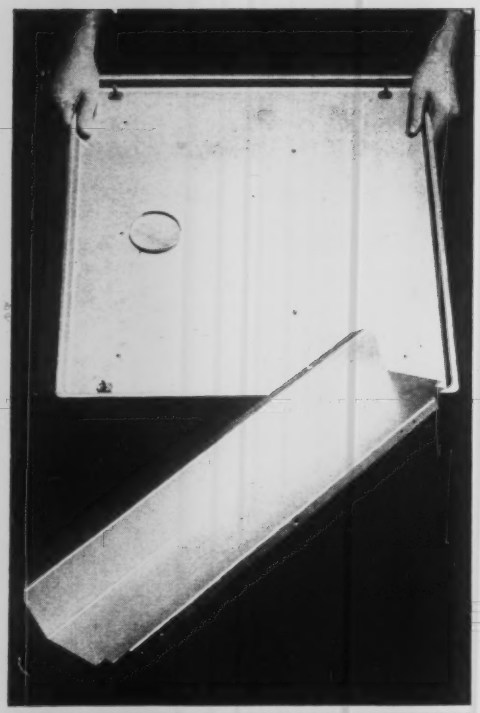

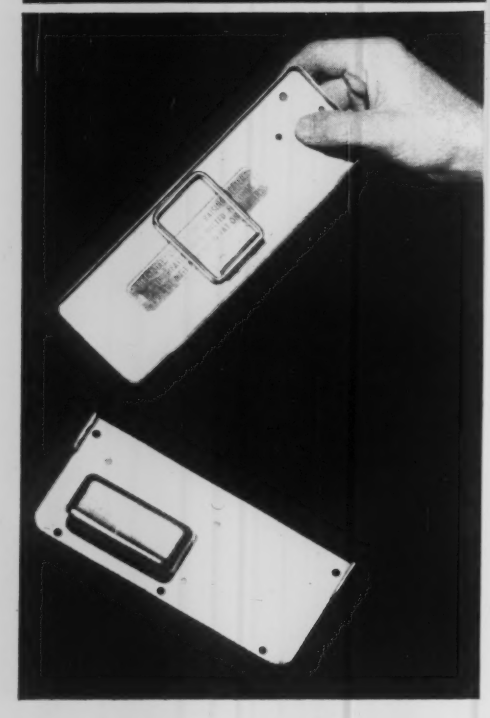

SAVED: $2.50 A UNIT

With 4 Heat-Resisting Parts of Armco ALUMINIZED STEEL

Looking for a low-cost metal to "handle" high heat?

Read what Mr. J. Jarmuth, Plant Superintendent, Wells Manufacturing Company, San Francisco, says about Armco ALUMINIZED STEEL Type 1 and cost savings in commercial frying units:

"Every item in our Counter-Mate line contains ALUMINIZED STEEL. Its advantages in high-heat applications are obvious, but we have been able to obtain equally important benefits from the cost standpoint.

"Neither plated nor baked enamel parts on concealed or semi-concealed details of our units have been completely satisfactory. Both have been far more expensive than ALUMINIZED STEEL.

"For example, on our F-77 double fryer we have improved the durability of the product by switching to ALUMINIZED STEEL for control box backs and bottoms, shell bases, and outlet boxes. At the same time, we have effected a net saving of $2.50 a unit and have eliminated the coordination problem with local plating shops.

"As we become more and more familiar with fabricating techniques in forming, drawing, and spot-welding ALUMINIZED STEEL, we are expanding our use and are confident that it is a major factor in the successful quest for a better product at lower cost."

Perhaps Armco ALUMINIZED STEEL is a low-cost answer for heat-resisting parts of your product. Fill in and mail coupon for complete information.

New steels are born at Armco

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Russia's Biggest Weapon?

"Our race with Russia will not be won by a lot of average students, average scientists, or average production workers.

"We will stay in front as we stimulate top quality, high performance, and hard work and provide solid encouragement for everyone to do his best."

That thoughtful statement by President Benjamin F. Fairless of the American Iron & Steel Institute becomes even more significant in the light of two of Khrushchev's latest moves:

His announcement of the new Soviet seven-year plan (1959-65).

His demand that the Western powers quit Berlin.

The seven-year plan calls for an 85 to 88 per cent increase in industrial production, a 62 to 65 per cent increase in consumer goods (mostly soft) production.

Steel production is scheduled to take a big jump—from 60 million tons in 1958 to 95 million to 100 million tons in 1965. Fourteen hundred automated machining lines are planned for the metalworking industry. Twenty-five billion dollars will be spent in building a strong chemical industry.

Those goals will be achieved by people who have little knowledge of life in the West. They have been sold on working hard now so they can enjoy a better standard of living later on.

Despite such evidence, few people are really alert to Khrushchev's ultimate objective of world Communism through economic aggression.

What can we do to implement Mr. Fairless' thinking?

Of course, metalworking managers can (and must) help by taking every opportunity to alert their employees. But, in our opinion, no countermeasure can succeed until a more basic change takes place: We, as individuals, must recognize that the Soviet menace amounts to a real and present danger, not merely a remote threat we'll worry about when and if we ever have to.

Our apathy could be Russia's biggest weapon.

Irwin H. Such

EDITOR-IN-CHIEF

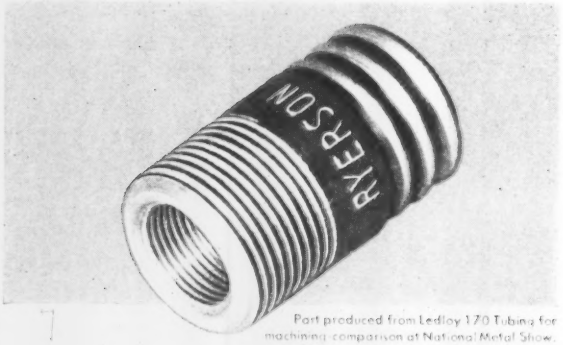
NEW LEADED STEELS FROM RYERSON

Now, machine parts faster than ever before

NEW LEDLOY 170 TUBING

average machining speed 170 surface feet per minute

Here's the fastest-machining steel tubing ever produced —and only Ryerson has it available for immediate shipment from stock. Ledloy* 170 is a cold drawn, seamless product of low carbon analysis with .15% to .35% lead added. It promises a minimum increase of 25% in productivity of machined parts or components. Sizes range from 1" to 2½" O.D. with maximum ⅜" wall thickness. Other sizes can be supplied promptly.



Part produced from Ledloy 170 Tubing for machining comparison at National Metal Show.

NEW LEDLOY 375 BARS

average machining speed 375 surface feet per minute

This newest addition to Ryerson free-machining screw steel stocks is the world's fastest-machining steel. Assigning the figure 100 to B-1112 and using this as a base, Ledloy 375 has a machinability index of 205 plus. It rates about 64% higher than B-1113 and about 20% higher than Ledloy 300.

Ledloy 375 bars presently in Ryerson stocks include rounds in sizes from ¼" to 1", hexagons ¼" to ⅝".

Ask your Ryerson representative for complete details on these new steels. And call Ryerson for an unequaled selection of cold finished bars and tubing, including the largest stocks of Ledloy 300 (also known as Ledloy A) and Rycut* leaded alloys—the fastest machining in their carbon ranges.

MACHINING COMPARISON*
Ledloy 170 Tubing vs. Nonleaded Tubing

	Ledloy 170		MT-1015	
	Speeds	Feeds	Speeds	Feeds
Center drill	172 s.f.m.	.005"	110 s.f.m.	.005"
Form tool	172 s.f.m.	.0008"	110 s.f.m.	.0008"
Boring tool	172 s.f.m.	.007"	110 s.f.m.	.007"
Cutoff	172 s.f.m.	.0013"	110 s.f.m.	.0013"
Thread	27 s.f.m.	—	20 s.f.m.	—
Tap	18 s.f.m.	—	12 s.f.m.	—
Production time	35 seconds		49 seconds	

* As demonstrated at National Metal Show, Cleveland, 1958.

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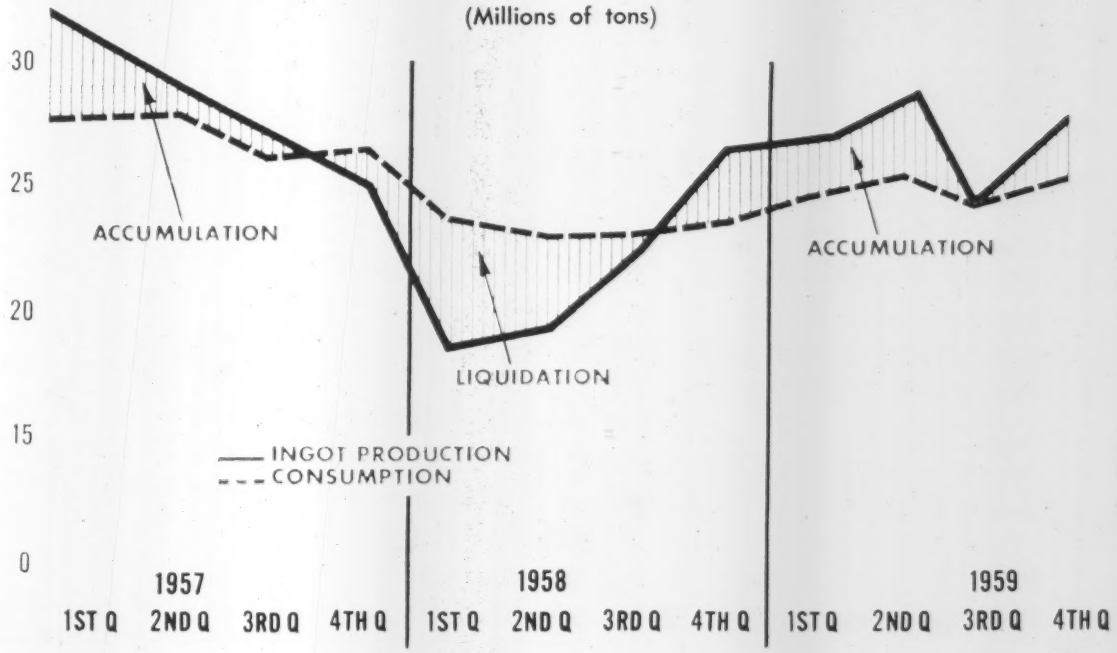
Steel Inventories: A Change for the Better



How Much Boom in the Recovery?

No boom, but a broadly based and sizable uptrend in the coming year, predict industry leaders at NICB meeting. Big problems: Inflation, imports, pinched profits

LOOK FOR "a vigorous but uneasy recovery" in 1959.

That's the collective opinion of 11 chief executives of blue chip companies in basic industries. They discussed the outlook for sales, prices, wages, and profits at a National Industrial Conference Board meeting at Cleveland.

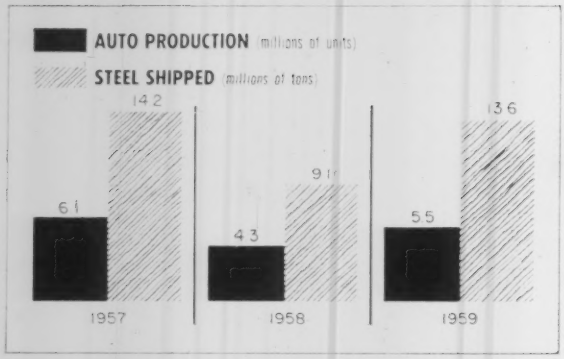
• **Steel**—Thomas F. Patton, president, Republic Steel Corp., predicts 1959 ingot production will be 102 million to 110 million tons (vs. an expected 85 million this year). That would mean an industry operating rate of 69 to 76 per cent (1959 capacity). He says production should rise each quarter—barring a strike.

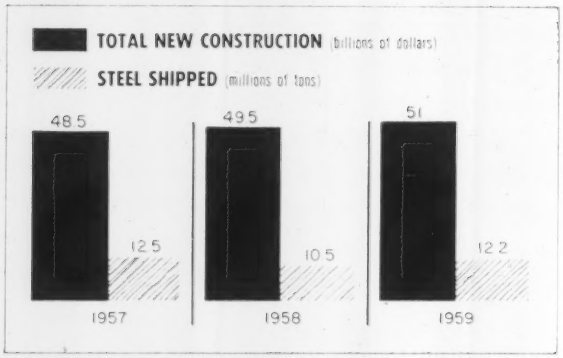
Three factors will have a strong impact on steel shipments: 1. The trend to inventory rebuilding now underway (see chart above). 2. Improvement in sales of consumer durable goods. 3. A strong and rising demand for producer durables.

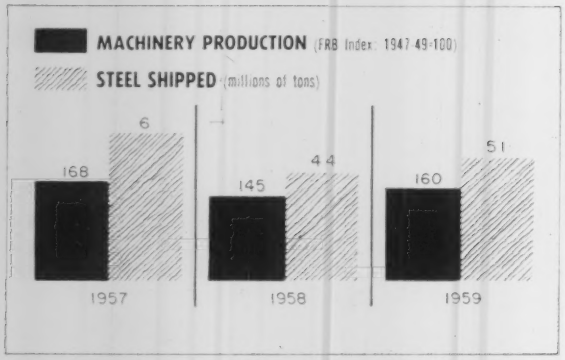
• **Autos**—Mr. Patton expects about 5.5 million cars to be built next year. That gain, coupled with an inventory buildup, should lead to a 50 per cent jump in steel shipments to the auto industry, he believes.

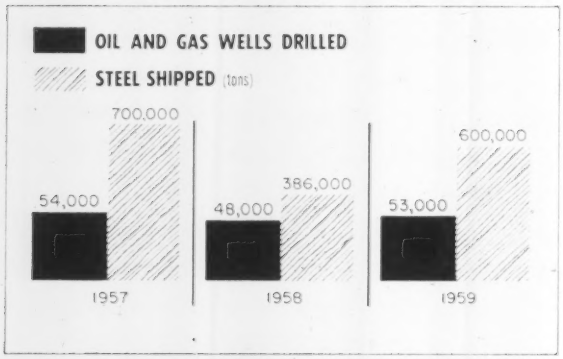
George Romney, chairman and

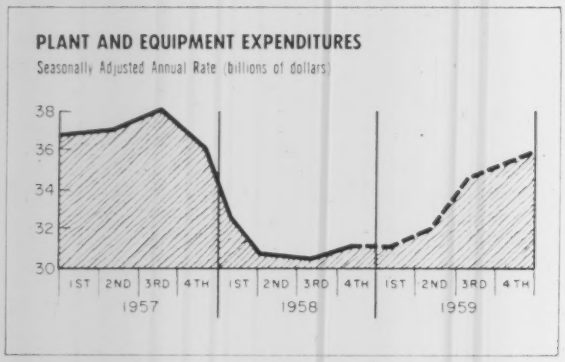
T. F. Patton, president, Republic Steel Corp., predicts business volumes in major steel consuming industries for the coming year

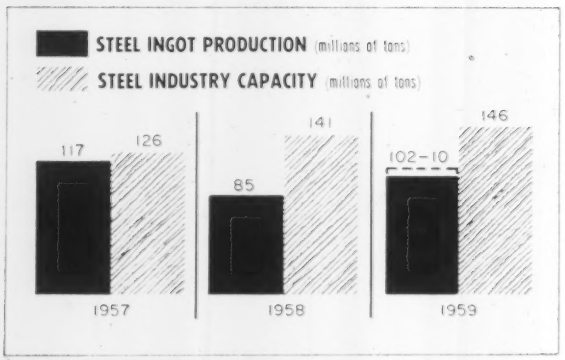












Source for charts on Pages 57 and 58 is Republic Steel Corp.

president, American Motors Corp., predicted "a stronger auto market in '59." Reasons: 1. Disposable income is rising rapidly. 2. Consumer credit will expand. 3. Stocks of '58 models are being cleaned up early. 4. This year's sales only approximated the annual scrappage rate, so there was little expansion in the number of cars on the road.

• **Construction**—Mr. Patton looks for steel shipments to the building industry in '59 to climb about 20 per cent above this year's total (to 12.2 million tons).

• **Machinery**—In 1959, makers of industrial machinery may need up to 20 per cent more steel than they did in 1958, believes Mr. Patton. He says shipments to farm machinery manufacturers will "show a good increase" due to inventory restocking.

• **Oil & Gas** — Shipments of oil country goods will zoom 55 per cent above this year's level, believes Mr. Patton. J. C. Donnell II, president, Ohio Oil Co., anticipates a gain of about 5 per cent in domestic demand for petroleum in 1959. He says the industry's capital expenditures will climb but not to the 1957 peak of $6.6 billion.

• **Railroads**—Mr. Patton says steel shipments to railroads should rise next year. H. W. von Willer, president, Erie Railroad, thinks the industry will spend $1 billion for

capital improvements (vs. $700 million this year and $1.4 billion in '57). He says the carriers should spend about $20 billion in the next decade, but their depressed financial condition won't allow it.

• **Public Utilities**—Elmer Lindseth, president, Cleveland Electric Illuminating Co., predicts a moderate decline in capital spending by electric utilities next year. They accounted for nearly one-seventh of total industry expenditures this year. Mr. Lindseth notes the possibility of greater competition from public power projects in '59 because the Democrats will hold the reins.

• **Imports Cause Alarm**—Competition from abroad will intensify next year. Mr. Patton reports that West European steelmakers are selling pipe in Minnesota at prices below U. S. producers' minimum quotations. In a tour of foreign tiremaking plants, E. J. Thomas, chairman, Goodyear Tire & Rubber Co., noted that the total wage of a European worker about equals the cost of a U. S. laborer's fringe benefits. Mr. Romney contends there is higher productivity abroad because those countries are "battling for survival." For the first time, foreign auto production now exceeds that of the U. S.

• **Summary** — Martin R. Gainsbrugh, NICB's chief economist, termed 1959 "a disturbing period of prosperity." While sales will climb, with some industries posting records, the framework will be disquieting—due to inflation, the profit squeeze, and damaging competition from abroad. But Mr. Gainsbrugh summarized the upward trend with these predictions for spending:

(Seasonally Adjusted Annual Rates)
(Billions of dollars)

	1959's 4th Qtr.	1958's 3rd Qtr.
Gross National Product	465-470	440
Personal Consumption	305	292
Private Domestic Investment	70	54.5
Producers' Durables	25-26	22.3
Business Inventory Change	+2 or 3	−4
Government	97	93
For Defense	46.5	46.5
By State, Local Agencies	43	40

Faster Writeoff Allowed

The new first year allowance is worth consideration of small and large companies. Depreciable asset worth is limited now to $10,000, but it may be expanded, MAPI predicts

IT MAY PAY YOU to evaluate your tax position in the light of new Section 179 of the Internal Revenue Code. It allows a taxpayer to write off 20 per cent of the cost of depreciable property if the deduction is taken in the year of acquisition and the cost of the property does not exceed $10,000.

• **How It Works**—If a manufacturer purchases equipment at a cost of $10,000 and chooses to apply the new ruling, he will receive a first year allowance of $2000, plus the depreciation allowance normally allowed (computed on an $8000 basis).

The allowance applies only to tangible personal property, used or new, which was acquired after Dec. 31, 1957, and has a useful life of at least six years. If the cost of the property exceeds $10,000 in a tax year, the owner may elect the items he chooses, but their value must not exceed $10,000. The limit is doubled in the case of a husband and wife filing a joint return.

• **First Year Writeoff**—A booklet published by the Machinery & Allied Products Institute points out that the new section provides significant incentive for purchasing equipment.

MAPI's booklet uses an illustration to point up the impact of the writeoff: For a piece of equipment having a service life of ten years, the first year allowance would be 18.18 per cent of the purchase price (using sum-of-digits depreciation). Under the new provision, the percentage would climb to 34.55 per cent. With declining balance depreciation, it would hit 36 per cent; with straight line depreciation—28 per cent.

• **After-Tax Return** — MAPI predicts that the tax benefit may be broadened in its application. It points out: "If it were made applicable to equipment without any dollar limitation, it would increase the after-tax return by 6 to 8 per cent for companies now using either sum-of-digits or declining-balance depreciation and by 8 to 10 per cent for firms currently employing straight-line depreciation."

The institute adds: "Combined with the benefit of the new methods over the straight-line writeoff, increases in after-tax return would range from 15 to 25 per cent."

Percentage of Cost Written Off During First Year

Service Life (Years)	Double-Rate Declining-Balance Depreciation (Per-cent)		Sum-of-Digits Depreciation (Per cent)		Straight-Line Depreciation (Per cent)	
	Using Section 179	Not Using Section 179	Using Section 179	Not Using Section 179	Using Section 179	Not Using Section 179
6	46.7	33.3	42.9	28.6	33.3	16.7
10	36.0	20.0	34.6	18.2	28.0	10.0
15	30.7	13.3	30.0	12.5	26.7	6.7
20	28.0	10.0	27.6	9.5	25.3	5.0
25	26.4	8.0	26.4	7.7	24.0	4.0

Source: Machinery & Allied Products Institute.

A-Plane Funds Cut*

(Millions of dollars)

Fiscal Years	AEC	Air Force	Navy	Totals
1959	$74.6	$50.0	$21.0	$145.6**
1958	90.0	103.11	3.2	196.31
1957	80.4	99.0	1.4	180.8
1956	51.2	75.0	3.6	129.8
1946-55	84.8	98.02	2.3	185.12
Totals	381.0	425.13	31.5	837.63

Source: Air Force testimony before House Appropriations Committee.
*Includes funds allotted for both the atomic plane and nuclear-propelled rockets.
**Tentative figures.

Reds May Beat Us Again

Our atom plane program is sagging. Proponents claim we need a prototype soon or Russia will be first. The administration wants an operational model or nothing

AMERICA'S highly touted atomic airplane is as firmly rooted to the ground as it was at its conception in the mid-1940s.

Grounded by lack of enthusiasm in high administration circles and by scientific squabbles, the program lacks even a prototype aircraft.

The U. S. stands to lose this race in much the same way it lost to Russia in the satellite race. The Communists will have an atomic-powered plane soon—if you believe the Russian scientist who talked with Rep. Melvin Price (D., Ill.) last year in Moscow.

• **Squelched**—President Eisenhower and his advisers have taken a stand against putting an experimental atomic plane into the air.

Said the President: ". . . Such an effort would divert extremely scarce talent from attacking fundamental problems that must be solved before a militarily important aircraft can be produced."

• **Critics in Capital**—That view collides with those of such Congressional figures as Representative Price and Rep. Carl T. Durham (D., N. C.), members of the Joint Congressional Committee on Atomic Energy.

They charge: ". . . The administration's decision to abandon the concept of achieving a nuclear flight capability at the earliest possible moment constitutes a serious setback to our aircraft nuclear propulsion program."

Critics further charge the administration erred in its evaluation of the psychological effects of Sputnik I. A Russian first in the nuclear plane would be equally disastrous, they say.

• **Opposition in Industry**—A strong segment in industry also disagrees with the administration's attitude.

J. Carlton Ward Jr., president, Vitro Corp. of America, headed the first nuclear plane program at Oak Ridge in 1946. He says: "We could have had an atomic plane by 1952 if we had gone ahead with the program. If we wait until all specifications are laid down (like the President wants to do), we will never have one.

"Our best approach is to get a prototype plane up swiftly. It wouldn't be highly efficient, but would provide valuable data. In today's program there's too much theory and not enough doing.

"The jet engine is an example. We wouldn't have it today if we had kept postponing the prototype until it was as efficient as the piston plane. No prototype ever approaches final development."

J. F. Brady, Convair Div., Los Angeles, General Dynamics Corp., sums up the views of many industrialists: "If only our politicians, military leaders, and numerous Department of Defense committees would realize that even with our first crude powerplants we can show useful aircraft—and if they would only recall the low performance of our first jet aircraft—and if they would realize that these beginnings are developing a knowledge of almost unlimited possibilities—then maybe they would try for a less ambitious program and help this country to be first with nuclear-powered aircraft."

• **History**—Our program has had opponents since its inception. During the early years, it was opposed by some scientists and military people.

Spending plans developed in a slow curve from 1947 to 1953, when former Defense Secretary Charles E. Wilson described the atomic plane as "a great big bird that flies over the marshes." He added: "It doesn't have much speed to it or anything, but it can fly."

The program was rescued by the Joint Atomic Energy Committee at the last minute and efforts were fairly consistent until 1956. Air Force brass embraced it then, and plans were laid for stratospheric spending. They were shot down within a year by contractors who reported that technical difficulties

made target dates unrealistic. Before the President spoke out, a clear conception of the plane's military usefulness was lacking, and spending had declined steadily.

• **Dollars**—It's hard to pinpoint how much has been spent. The table on Page 60 shows appropriations, but it's doubtful that all have been used. The picture is further fogged because figures are for both the atomic plane and nuclear-propelled rockets.

Probably better than $500 million was poured into the program through fiscal 1958. Less will be spent in fiscal 1959 as the President's slowdown order takes effect.

• **What's Going On**—Work has centered on development of a nuclear engine and preliminary airframe studies.

General Electric Co. (under a contract with both the AEC and AF) is working on a direct cycle, turbojet engine (air from a turbojet engine compressor is heated in the reactor core, then exhausted through the turbine). Feasibility of a prototype has been proved in ground tests, says GE.

Pratt & Whitney Aircraft Div., United Aircraft Corp., has an AEC contract to study an indirect cycle engine, but it has been cut back.

Only two firms have airframe contracts. Lockheed Aircraft Corp. has an R&D contract with the AF to study design. Within two months, it expects to open a laboratory for the study of materials. The company also has a mock-up of the interior of a nuclear-powered plane to test the effects of strain on a crew confined for five days in small quarters.

Convair has an R&D contract with the AF and is doing similar work for the Navy.

• **Nearest Yet**—The closest thing to success so far has been Convair's NB-36H, an AF bomber which made 47 flights with an operating reactor aboard. Purpose: To study radiation effects and shielding techniques.

The Navy hopes to get an atomic seaplane aloft by wedding a reactor to an existing airframe.

Martin Co. was recently awarded a contract of over $385,000 for engineering studies on the seaplane. Contemplated: A "fleet" of seaplanes that could be used for anti-submarine warfare, radar picketing, and cargo carrying.

Claims the Navy: A seaplane of 2.2 million lb gross weight could haul a 770,000-lb payload, much more than gasoline or chemically fueled planes.

• **Target Dates**—The Navy is shooting for a successful atomic flight by 1964 or 1965. Air Force enthusiasts used to talk about such a flight in the early 1960s; they aren't saying much now.

Unofficial opinion: The first Air Force plane won't be in the air for at least five years, probably longer.

• **What Will Be Needed?**—Requirements on materials are either classified or unknown. They will have to resist radiation to shield men and sensitive parts, have good resistance to high temperatures and corrosion, and have high strength-to-weight ratios.

Included will be: Aluminum alloys, magnesium, titanium, stainless, chrome moly, copper, and brass.

• **Potentials**—The military and commercial possibilities of an atomic plane could make this an enormous future market for metal-working. Mr. Ward says the atomic plane could: 1. Stay aloft for long periods. 2. Operate at maximum power at all times. 3. Operate as a missile platform. 4. Fly higher and faster than conventional aircraft.

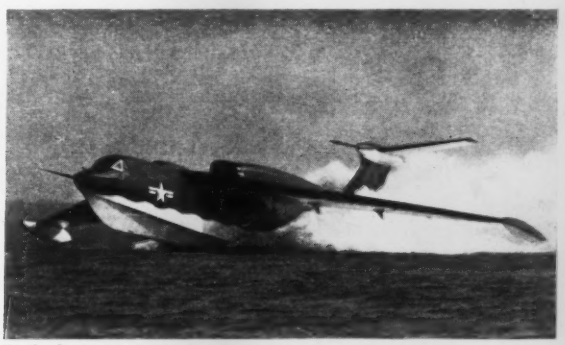
Lockheed says a large transport using a nuclear reactor as an energy source can be successfully designed to carry a "logistical payload" of 50 tons or more 24,000 miles or farther.

• **A-Plane's Future**—Prospects are the program will stumble along as it has in the past, although the new Congress may push through a souped-up version.

A forthcoming decision of Deputy Defense Secretary Donald Quarles on whether to stick with both the AF and Navy programs may help set the atomic plane on course.

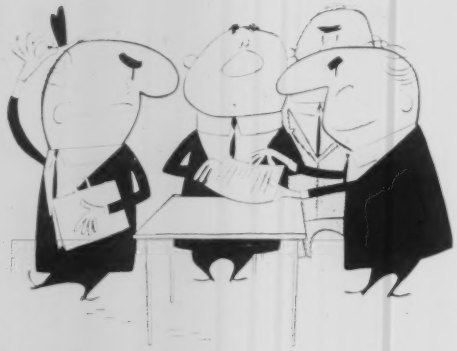
Convair Div., General Dynamics Corp.

CLOSEST WE'VE COME: Hot reactor was carried in this Convair B-36 intercontinental bomber to study effects of radiation on instruments, equipment and airframe, and methods of shielding materials and men



Martin Co.

FIRST AFLOAT? A conventional jet seaplane wedded to a nuclear reactor may mark America's entry into the atomic space age if proponents in the Navy Department have their way



Renegotiation Case Histories

COMPANY A

The Chicago regional board (it has since been combined with the Detroit board) determined the company's ratio of profits to sales—9.7 per cent—was reasonable. But the national board (headed by Thomas Coggeshall in Washington) did not agree. It set excess profits at $750,000.

Point: The board is arbitrary, without fixed standards.

COMPANY B

This firm sells a product identical to that produced by Company X. Each product is sold for the same price to Uncle Sam, and each company makes the same profit. But Company B has an old plant carried on its books at $500,000. Company X has a brand new plant carried at $1 million. So B's net worth is much less than X's, and its profits are twice that of X's on a percentage of net worth basis. Company B underwent renegotiation; Company X did not.

What's Wrong with Renegotiation?

The law will be reviewed and probably extended next year. Industry wants it modified. STEEL will devote three articles to this vital subject. Here is the first

HOW would you feel if you had to wait until 1962 to find out how much profit your company made this year?

How would you feel if you were told four years hence that your firm had made too much money in 1958? Would you have it to give back? Or would it already have been plowed back into the business or paid to stockholders?

Those questions are real if your company is subject to renegotiation. The law was extended six months (to June 30, 1959) by the last Congress. The new Congress will decide whether to kill it, amend it, or keep it intact.

In the next three weeks, STEEL will explore the problem of renegotiation in an effort to learn whether the process is necessary, where it has possibly drifted from original intentions, and what the chances are of amendments being voted in the next Congress.

• **Profit Killer?**—With certain exceptions, firms doing $1 million worth of business annually with the government are subject to renegotiation. Result: A running feud between Chairman Thomas Coggeshall's Renegotiation Board and many members of U. S. industry. The subject: Does renegotiation protect the taxpayer by curbing excessive profits or does it simply penalize manufacturers efficient enough to increase profit margins by discovering new cost cutting methods?

It's not surprising, observes an Aircraft Industries Association spokesman, that industry officials beat a path to the board's door. In 1953, he points out, six airframe manufacturers saw the board cut their earning ratios from 7 to 6.2 per cent (an average). In 1954, the cut was from 7.4 to 6.2 per cent.

Because of huge aircraft and missile expenditures, the law operates mainly in that industry. In fiscal 1957, eight airframe builders were ordered to return $33.6 million. North American Aviation Inc.'s case for 1954 profits is before the tax court now. The board has ordered it to return $14 million, 25 per cent of its profits for that year. Fifty other aircraft firms had excessive profits of $16.7 million in fiscal 1957, says the board.

AIA says Grumman Aircraft & Engineering Corp. lost all its incentive profits for 1953, plus $2 million of its basic earnings.

Point: Having no Congressional definition of "excessive" profits, the board uses the return on net worth rule in many cases. In the defense business, the rule is of little use because of the high proportion of government furnished equipment.

COMPANY C

This sewing machine manufacturer went into the machine gun business. It lost money the first two years of the contract because it had to retool and the Pentagon requested many modifications of the original design, on which it had been low bidder. (The contract had been held by a single source supplier.) With all the bugs removed by the third year, profits started to appear. Ordered to return some of its profits, the company is fighting the decision because it claims losses of the first two years should be balanced against the better than normal profits of the third year. But it is maintaining a large cash reserve to pay Uncle Sam, in case it can't change the board's mind.

Point: A small firm helped the government by underbidding a single source supplier then was not allowed to cancel its tooling costs against its profits. The board failed to look at the whole picture of this company's contribution to the defense effort.

Others are also smarting. The Machinery & Allied Products Institute cites the case of a 237-employee firm which has spent 130 weeks of executive time and $37,000 contesting a board order on its 1952 profits.

• **Industry Argues** — Businessmen charge that where the statute applies to total business rather than individual contracts, it cannot be fair. Industry people argue that money may be lost on one contract and no allowance allowed for the loss under the board's interpretation of the law.

Where standards are lacking for judging excess profits, industrialists say, Congress should not turn the job over to the discretion of a few men.

But Congress has done just that with the result that industry has little chance of redress in the courts. The board does not attempt to establish its procedures on a legal basis. Precedents have no bearing on a case.

Bitterly aware of such facts, few firms resist board rulings. In fiscal 1957, 337 out of 395 determinations of excess profits were settled by bilateral agreements. Of the 58 others, only 26 carried appeals to the U. S. Tax Court.

Rep. Cecil King, (D., Calif.) headed a drive this year that would have allowed disgruntled firms to carry cases to the U. S. Court of Appeals. The movement was killed in the Senate, the opposition being led by Sen. Francis Case (R., S. Dak.), author of the original renegotiation law (1941).

• **Browbeaten** — Secrecy of board deliberations is another thing causing industrial leaders to turn to tranquilizers. A spokesman for the National Security Industrial Association says a company "never sees and can never refute" the evidence upon which the board bases its order. Industry, naturally, contests the right of a government agency to operate in such a manner, and several congressmen agree.

Some House Ways & Means Committee members have told STEEL they feel that the Pentagon uses renegotiation as a tool to keep contractors in line. If it were based on individual contracts, it would be fairer, claims Rep. Thomas Curtis (R., Mo.).

• **The Board's Answer**—Mr. Coggeshall claims that renegotiation is needed as a protection to the taxpayers. He denies the charges of unfairness.

Excess profits, says a board spokesman, are defined by six criteria:

1. "Reasonableness" of costs and profits, considering volume and normal earnings.
2. Net worth with regard to the "amount and source of public and private capital employed."
3. Extent of risk.
4. Nature of the firm's contribution to the defense effort, including its "co-operativeness" with the government and other contractors on R&D.
5. Character of the business, including material sources, complexity of manufacturing techniques, extent of subcontracting, and turnover rates.
6. "Other factors" which should be considered in the public interest.

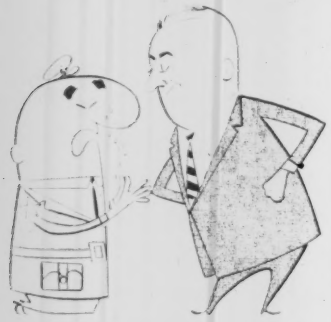
In answer to the charge that incentives for cost cutting are lost when the board takes away profits without due regard for their nature, Mr. Coggeshall explains that the original cost estimate may have been too high. In such a case, he adds, incentive profits may not actually exist.

• **Kill It or Train It?**—Industry members aren't in agreement over ending renegotiation. NSIA warns that a return to the Vinson-Trammell and Merchant Marine Acts (which date to the 1930s and call for a straight percentage limit on profits) might leave some industries worse off than they are now.

But all companies agree that something must be done about the law.

Conditions which existed during World War II and the Korean conflict called for renegotiation: Defense procurement haste—produced contracting errors which needed adjusting. But things have changed, they argue. Just as the taxpayers needed recourse then, U. S. industry needs it now against arbitrary renegotiation.

In next week's issue, STEEL will discuss industry plans for modifying the act in the next session of Congress.



Will Army's Plea Be Heard?

GEN. Maxwell Taylor, chief of staff, says the Army needs a five-year modernization program costing $15 billion to keep abreast of advancing technology. That's double the present rate of spending for Army hardware.

The plea sounds hollow after Defense Secretary Neil McElroy's announcement that Army personnel will be cut back to 870,000 by the end of fiscal 1959, as planned before the Lebanon crisis. More cuts are possible, he hints.

Here's what the Army wants the money for: Better missiles, more extensive use of electronic equipment, advanced tactical aircraft, better trucks. With Mr. McElroy waving the budget flag high, the Army's chances are slim. Its budget will be cut if White House plans for transferring the Redstone Arsenal and its scientists to the National Aeronautical & Space Agency go through. General Taylor calls the plan "a national disaster."

Closely allied with it is the Pentagon's desire to scrap the IRBM program. Mr. McElroy thinks we should rely on ICBMs fired from the U. S., rather than seek more overseas bases for IRBMs. Much of the Army's missilework has been with IRBMs. The Jupiter will probably be phased out by the end of fiscal 1959, the Air Force's Thor by the end of fiscal 1960, guess some sources.

The fate of the Army's solid fueled Pershing is hazy, although one industry source reports its tactical capabilities justify expansion of the program. Whether the Pentagon budgeteers will see it that way is another thing.

Navy Gains What Army Loses

With the demise of the Army (at least that's the way a lot of people see it), the Navy's future is brightening. Enthusiasts are betting on funds for another atom-powered aircraft carrier, on the theory that naval aircraft are needed for limited wars. While the Pentagon is still holding up funds for more atom submarines, few see Mr. McElroy's reliance on the ICBM extended to the point of curtailing our Polaris program.

Mr. McElroy's hint that "marginal" missiles will be dropped from our programs probably refers to birds already obsolete (like the Snark). Controversy among the Nike, Hercules, and Bomarc proponents may be resolved soon, too. With the House Armed Services Committee scheduling a wholesale review of our programs, it appears the Pentagon is preparing to do its own cutting before Congress gets at it.

Report on AF Program

Here are some alleged "deficiencies" noted in an inspector general's report on missiles.

1. Purchasing departments of large Air Force missile contractors are said to lack the necessary status to get the best product for the least money. The inspector general contends that purchasing agents are not paid enough to insure high grade personnel and that manufacturing and engineering department personnel of some contractors often override purchasing decisions or simply ignore the PAs.

2. Such lack of co-ordination, it is said, has meant subcontracting at "premium prices," as well as attempts to make some components in a contractor's shop when he could have subcontracted them at less cost.

3. There has been too little "followup" on subcontracts. Usually, such lack of control has not been called to the attention of the Air Force until the situation became "critical." The report says: At one time, of 152 subcontracts assigned to the Los Angeles Air Procurement District for administration, 28 were delinquent and 32 were overrunning target cost estimates.

4. It was stated that contractors were using overtime pay to retain engineers. The report implies that the bonuses were not necessary to the program.

5. Facilities and equipment have been leased from commercial leasing firms, says the report, at "excessive" costs and charged to Uncle Sam as overhead. The report notes much of the equipment could have come from the National Industrial Equipment Reserve.

GAO Is Investigating

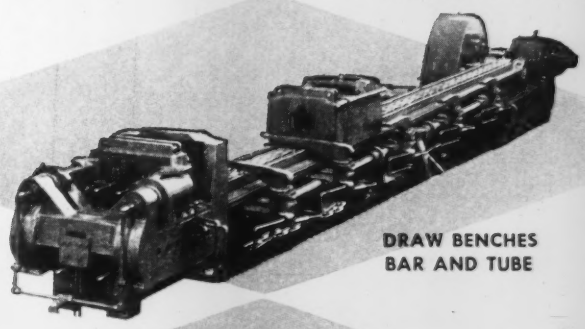
Industry is "generally" satisfied with the AF procurement methods, says the inspector general's report.

The General Accounting Office, the government's financial watchdog, is conducting a full investigation of the missile program.

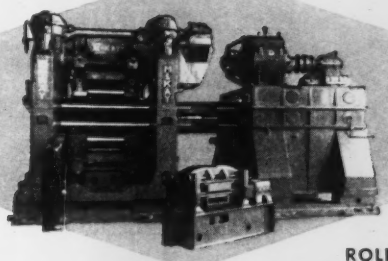
The inspector general's report, heretofore secret, has been requested by the GAO but is being withheld (except for a 35-page summary) with the blessing of President Eisenhower. He notes that such reports are traditionally a matter for internal consumption only. The GAO is using this report as a test case in its long fight to gain access to Pentagon reports. It recently worked out an agreement with the Army for such reports.

Rep. John Moss (D., Calif.), head of the government information subcommittee, will carry GAO's fight to the floor of Congress next session.

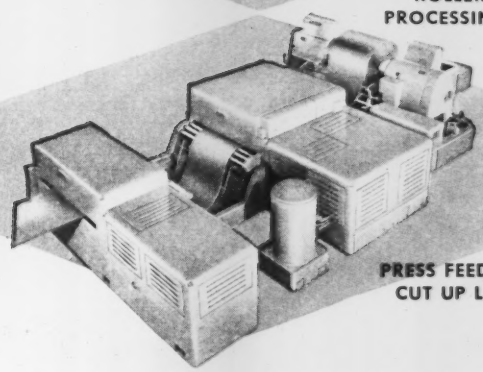
TUBE MILLS AND
FORMING MACHINES



DRAW BENCHES
BAR AND TUBE



ROLLER LEVELERS,
PROCESSING MACHINES



PRESS FEED AND
CUT UP LINES

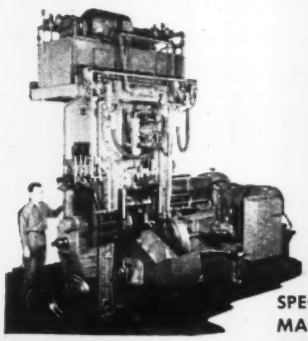
Metal working Automation in action...

If you're in the metal working business, you should be acquainted with McKay *automated* lines available for many metal working operations.

McKay pioneered and has played a leading role in the development of such equipment as that pictured on this page.

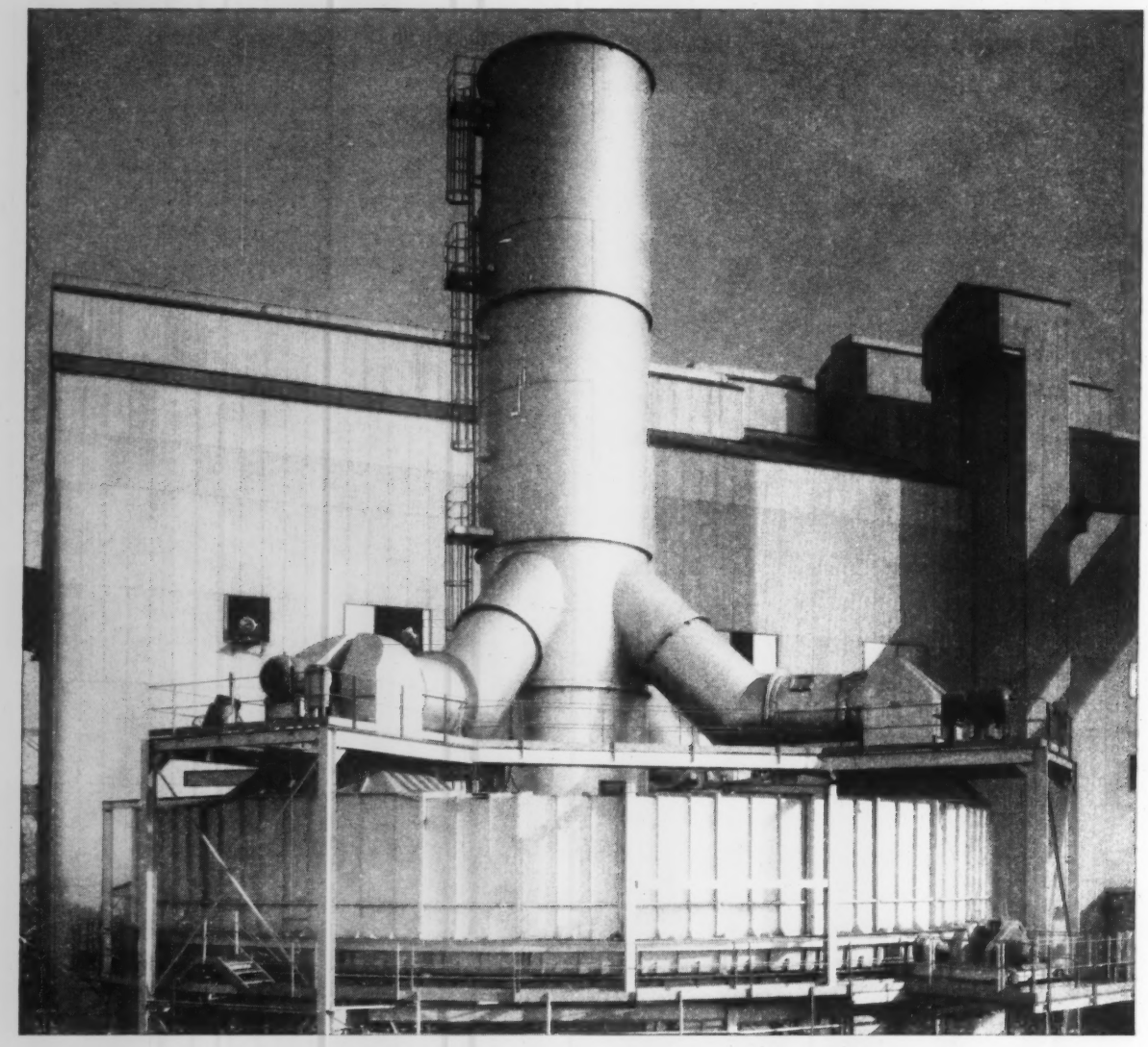
Basic McKay designs can be modified, or special machines developed to meet specific requirements.

THE McKAY MACHINE CO., YOUNGSTOWN, OHIO



SPECIAL
MACHINERY

McK



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Dravo-Lurgi circular sinter coolers increase usable tonnage output in sintering operations by reducing shattering and dust.

This cooler puts a large volume of low velocity air-flow through a relatively thin bed of sinter . . . lowers temperatures to approximately 200 F at the discharge end, cool enough for conveyor handling.

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- No need for plows or scrapers at the unloading end.
- Sinter is undisturbed during cooling—minimizing sinter breakup.

Let a Dravo engineer demonstrate how Dravo-Lurgi sinter coolers (either circular or straight) can increase *usable* tonnage in your operation. Contact DRAVO CORPORATION, PITTSBURGH 22, PENNA.

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Numbering Exposes Waste

It's no gamble. Dow finds that its report system leads to savings on plant equipment maintenance. Trouble in excessive cost areas is quickly pinpointed

DOW CHEMICAL CO. expects to save at least 10 per cent annually in maintenance costs of its Midland Div. by using a subnumber maintenance report system which shows exactly where each maintenance dollar goes.

Here's how it works: Code number 1831.3 in the cost report below represents a shaft bearing for an evaporator pump. Early this month, the bearing frequently burned out, causing maintenance costs to soar in the Cal-Mag (calcium-magnesium) Dept. of the firm's Midland Div.

• **Detective Work**—The part causing trouble was quickly detected through use of a maintenance report similar to the one shown. Officials of the Midland, Mich., company substituted a bearing which would take the load. Results: Repair bills on the pump have been virtually eliminated.

Don Spalding, section superintendent, explains how the subnumber system operates. "Each group of equipment is given a code number that goes on all work order requests that leave the department. Every 30 days, the accounting section returns a record of all charges for maintenance on each piece of equipment to the department supervisor. They are placed on a single sheet of paper so they can be easily isolated and identified."

After a few months, Dow determines what equipment group costs most to maintain. Subnumbers are assigned to each piece of equipment in the group.

• **Example** — In the case of the shaft bearing, the initial code number (1831) was given to an evaporator equipment group. Pipes, pumps, and tanks were included. Monthly cost reports quickly proved this group was expensive to maintain. Subnumbers were assigned so each pump, each section of pipe, and each tank could be identified.

After a few more months of operation, it was ascertained that most repair costs cropped up on pumps, so each pump component was numbered. The shaft bearing was shown up as the villain.

• **Savings**—Cal-Mag produces calcium chloride, magnesium hydroxide, caustic sodas, and metal fluxes. Maintenance costs are high on production equipment. In the last nine years, the subnumber system has cut them 47 per cent.

Whenever repairs on any equipment group exceed $500 a month, Mr. Spalding requests a written explanation. Originally, the department superintendent questioned every bill over $2000 a month.

"Having built up a history of experience, the subnumber system shows how often equipment wears out. It provides facts and figures you can take to management to back up requests for new equipment. It also helps in scheduling preventive maintenance," he adds.

• **Spreading Out**—Based on Cal-

MAINTENANCE COST REPORT

(Month of November)

Equipment	Code Number	Direct Labor	Overhead Costs	Purchased Materials	In-Plant Materials	Total Costs
Evaporator Tank	4886	$93.70	$31.75	$62.50	$ 8.56	$196.51
Pipe Gasket	1725.6	7.00	2.11	13.67	18.09	30.87
Shaft Bearing	1831.3	54.30	18.25	43.60	1.80	117.95
Shaft Bearing	1831.3	54.30	18.25	43.60	1.80	117.95
Shaft Bearing	1831.3	54.30	18.25	43.60	1.80	117.95
Pump Component A	1831.7	16.50	5.50	9.42	32.25	63.67

Figures are not actual, are used only for illustrative purposes. Chart form adapted by STEEL.

Mag's experience, Dow's Midland Div. is extending the work order subnumber system to all plants. Since the division makes 700 products, making the system work everywhere is no simple task. Says Dr. William H. Schuette, division general manager: "Management places the initiative on department superintendents. We make a definite attempt to reward and recognize the supervisors who take steps to cut maintenance costs." Most managers are eager to try the subnumber method.

R. A. Jones, supervisor of methods and results, general plant supervisory staff, explains the division has set up nine categories in which all work orders will be processed: Emergency maintenance, regular maintenance, revisions and plant improvements, building repairs, housekeeping and safety, special services, experimental maintenance, and capital expenditures. Not all are directly related to maintenance, but each offers an important area of cost reduction.

The program is only beginning, and Mr. Jones estimates it will take from two to five years to collect background information.

He adds: "By using this system, we'll be able to find out what our repetitive cost items are and we'll know where our dollars are going. Then, by using the subnumber system in departments that show consistently high losses, we'll be able to develop the same kind of overall savings the Cal-Mag Dept. has shown."

Meets Foreign Competition

Operation of European plants by U. S. companies is the solution to many problems, says Willard F. Rockwell, president, Rockwell Mfg. Co., Pittsburgh. High costs and selling prices, world-wide dollar shortages, and customs barriers which are rapidly forcing U. S. manufacturers out of world markets are some of the problems cited.

Commenting on his firm's expansion of European operations, Mr. Rockwell says: "Lower labor and manufacturing costs permit us to bid low enough to meet foreign competitors' prices. Extended credit by the German and Italian governments enable us to assume credit risks we couldn't take otherwise."

The Revolt of Sheldon Schmaltz

SHELDON SCHMALTZ, vice president in charge of exhibits for Showalter Equipment Corp., returned from his seventeenth exposition of 1958 resolved to get transferred to another job.

The din of Showalter's machines (they were displayed in action at Atlantic City) still pounded in his ears. The thought of bourbon and water revolted him. His fingers were numb from a thousand handshakes. He couldn't get rid of the on-stage smile he had worn during his 10-hour days in the company booth. His feet hurt.

He lost no time going to the office of the president, Walter Showalter. Before he could lodge his complaints, the boss started in:

"Congratulations, Sheldon. More than 50 inquiries have already come in from people who saw your display in Atlantic City. This idea I had of putting you in charge of our whole trade show program was the best one ever. You're doing beautifully."

"Walter, that's what I came to see you about. I can't take any more of this. Seventeen shows this year! I never want to see Atlantic City, Philadelphia, Cleveland, or Chicago again."

"Now, Sheldon. Let's not start all over on this. We're at the end of the fall season. Nothing's scheduled until January. You can take it easy for nearly two months."

Schmaltz sprang to his feet and started pacing. "Take it easy! I'd have to start now on that January deal. We need to rebuild the booth. I've got to wrangle better space than the show managers gave me. I've got to dream up something to get more people into the booth. We need a new man to run the lift truck. Handley got drunk Tuesday night, and I had to drive the damn thing myself. A thousand details have to be attended to before the 1959 season. And I'm not up to it. Walter, transfer me to some other job."

Showalter got up this time, wrapped his arm across Schmaltz's shoulders. "Sheldon, you're the only man that can do this show routine. You know how we've pinned our selling effort on it."

"But 17 of them!"

"We're a big, diverse outfit, Sheldon. There are nearly 100 industrial shows a year, and we conceivably could be in all of them. You know we should be in at least 19, as we were last year. We cut it down for you, Sheldon."

"Walter, how can trade shows mean so much to you?"

The president withdrew his arm. "Look at those 50 inquiries I told you about. Your counts tell us that an average of 6900 people passed by our exhibit at each of the 17 shows this year. That's 117,300 people who at least saw our name, at least caught a glimpse of the products we make. We couldn't hope to catch that many people in a year with regular sales calls."

Schmaltz shook his head. "But there's so much waste in that attendance—school kids, people off the street. I've answered a million silly questions. It's one helluva grind."

Showalter spread his arms. "Sure, there's waste—as in any

sales method. Sure, it's a grind. But anything that's important takes hard work—and money spent on it. That Atlantic City affair cost us $7200, not counting your salary or that of the three assistants you had. We'll spend $12,000 on the January show. Sheldon, you're in charge of an annual trade show budget amounting to nearly $150,000."

"I'll still take my old job."

"And the old salary you drew as assistant sales manager?"

"Yes, that, too." Schmaltz almost shouted. "I retire in three years. I could make out on that until I'm 65."

The president raised his voice. "Never, Sheldon. It takes an expert like you at one of these shows. I can get a dozen assistant sales managers. I've only found one vice president in charge of exhibits."

"Then, I'll resign."

"You'll lose severance pay if you do. That's about $20,000 in your bracket. Just hang on for three more years. You get it when you retire at 65."

Schmaltz's eyes took on a speculative gleam. "You get severance if you're fired, too."

"Fire you?" The boss laughed. "Never, Schmaltz. You're the best in the business."

Sheldon left on that note, but the wheels were turning. He remembered a checklist he had seen in STEEL (Nov. 24, 1958, p. 69) on how to louse up a trade show exhibit.

How To Get Nothing Out of Your Trade Show Exhibit

1. **Let all plans go until the last minute.**
2. **Bring in a score of scantily clad girls to attract attention (to them, not your products).**
3. **Jam your display with samples of everything you make and reprints of all your ads and catalogs issued since 1939.**
4. **Don't waste money on building an exhibit. Rent some furniture (plenty of it to make the place look "busy"). Get a local sign painter to put your company's name on a placard or two.**
5. **Man your booth with apprentices and trainees. They'll learn a lot even if customers and potential customers do not.**
6. **Put all your best salesmen in the hospitality suite so they can entertain each other.**
7. **Demonstrate nothing in action. If anyone wants to see how your product works, they can buy it and find out.**
8. **Don't publicize your exhibit with tickets, announcements, or other references to it. The people that really want to see you will find you.**
9. **Make your booth as dark as possible so viewers will be forced to come in to see what you have.**
10. **Be sure your booth is in some secluded spot, so showgoers can come in to rest and not be bothered by excessive traffic.**

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

Planning Termed Key To Company Profits

PLANNING is management's secret weapon, says Gregory M. Boni, senior partner, Touche, Niven, Bailey & Smart, New York accountants.

Speaking before the Investment Casting Institute in New York, Mr. Boni emphasized that successful planning includes two steps: Establishment of "realistic objectives based upon knowledge of the market and cost behavior in your company," and continuing plans, controls, and policies which will allow attainment of objectives.

• **A Big Job**—Mr. Boni pointed out that efficient planning is not easy. It must utilize forecasting and extend to organization and facility requirements and research programs. Thorough consideration, he added, must be given to alternative courses of action and effects on profits.

Alternative courses must fit into the framework of the company's "dynamic pricing" policy, which, Mr. Boni said, should have as its objective maximum profits rather than maximum volume.

Finally, executives must have a good understanding of market trends so that accomplishments and objectives can be weighed properly.

• **Is Planning Needed?** — Another speaker, E. A. Johnson, vice president, Barry Controls Inc., Watertown, Mass., talked about groundwork for planning. His first point: Precisely define your business and your policies.

Mr. Johnson stressed the importance of putting that information into writing. "They (employees) want to know because they want to contribute, and they want the feeling that they're on a team which has a chance of being successful. You can give them this feeling if you will only tell them what it is that you're trying to do and what your policies are going to be," he said.

An executive has three main things to do, Mr. Johnson stressed: 1. Manage the business. 2. Manage the managers. 3. Manage the relationships between your managers and your workers.

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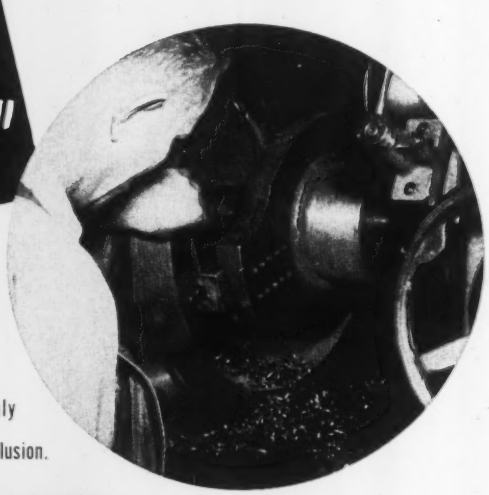
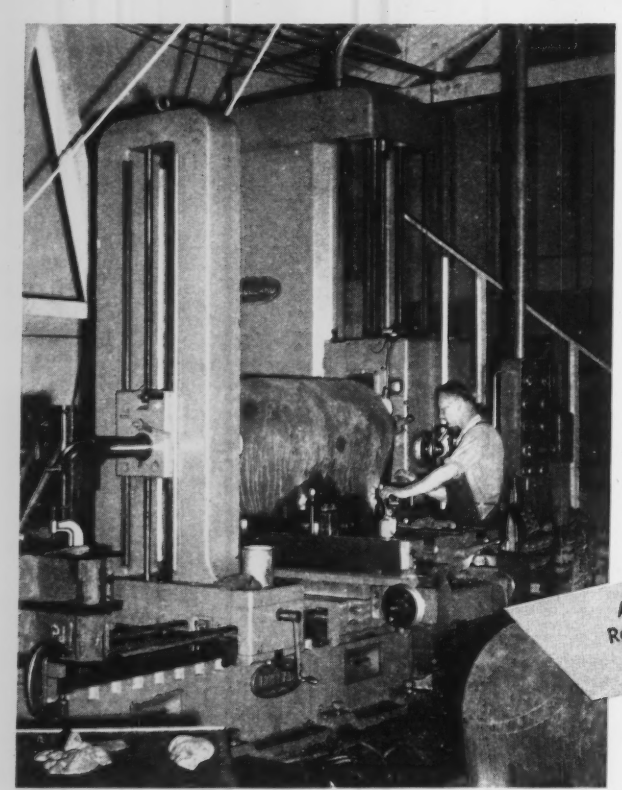


This statement by Mr. Reed Clark, General Manager, C. & H. Machine and Engineering Company, Berkeley, California summarizes, after thoroughly investigating and comparing competitive machines, their conclusion.



If you are planning to purchase a horizontal boring machine, we invite you to compare, feature for feature, the Bullard H.B.M., Model 75 with other machines in its field. You will discover that — "To Cut Costs When Cutting Metal — Buy Bullard" — is sound advice.

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Style

Transmission

Engine

Detroit Looks to 1960 Cars

Automakers are releasing orders for tooling and parts for next year's models. Metalworkers can expect more business as autodom plans sweeping changes

NOW THAT 1959 models are on the road, Detroit is thinking of ways to titillate the public's fancy in 1960. Changes are coming in styling, body construction, and transmissions.

Reports are largely in the rumor category, but enough tooling is out to indicate that Plymouth will have a unitized body. Other Chrysler lines won't. The corporation is scheduled to make major styling changes in 1960 models and again in 1962.

It looks like Chrysler will retain fins, but they'll be canted more along GM lines. This will be the first year William Schmidt, executive stylist and assistant to Virgil Exner, styling vice president, will have his theories transmitted into production. Judging from his earlier designs (Packard Predictor and the 1955 Lincoln), next year's Chryslers will emphasize the sculptured steel styling in vogue at Ford.

• **In Dearborn**—Ford Motor Co. has pushed its 1961 program ahead and major styling changes now are planned for 1960. Grilles, quarter panels, hoods, decks, and doors will be changed, says one source. Use of only two bodies won't go into effect until 1961.

Reports that Lincoln will drop its unitized body next year have been confirmed by several sources. Lincoln's change stems mainly from design problems that have resulted in high production costs. The industry consensus seems to be that cars with wheelbases over 122 in. aren't adaptable to present unitized body designs. Lincoln has a 131 in. wheelbase.

• **General Motors** — GM is convinced that its standardized body program will save enough money to permit annual styling changes (if they're needed). But it looks like Buick and Chevrolet will change only grille and trim areas. Oldsmobile and Pontiac are expected to restyle quarter panels. Cadillac will remove some chrome.

• **Transmissions** — GM's Transaxle program has been shelved. It had been scheduled for Cadillac in 1960, but informants say an unfavorable cost balance has forced it to be set aside temporarily. Two redesigned Hydra - Matic transmissions are planned instead. One is called the Slimline. It's reportedly only 8 in. in diameter, which will help eliminate the floor hump in the front of the passenger compartment.

You may have heard that the Slimline will be used in Buick cars, too, but the rumor probably isn't true. Buick's Dynaflow has a good reputation.

• **Brakes**—Brakes are still one of motordom's biggest design problems. More lines will be switching to integrally cast aluminum wheel and drum combinations. They are mentioned as a standard item for GM divisions, possibly for Chrysler. Some reports peg 1960 as the year, but other sources claim the integral job won't come until 1961. At least one aluminum company is researching a powdered metal brake shoe: Coarser powders are cast directly into the face of the shoe for lining material.

Liquid cooled brakes are being investigated again for Lincoln. The luxury car group has three approaches to the liquid cooled models, developed initially by Ray-

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Beat-the-Experts Contest

The forecaster who comes closest to the number of cars built in the U. S. from Jan. 1 through June 30, 1959, will be awarded either a scale model of General Motors' experimental Firebird III or a full color print of a dream car rendered by George Walker, vice president and director of styling, Ford Motor Co. For full contest details, see STEEL, Nov. 17, p. 71.

I believe automobiles will be produced in the U. S. during the first six months of 1959.

Mail this to:

Beat-the-Experts Editor STEEL Penton Bldg. Cleveland 13, Ohio

PRINT NAME

POSITION

COMPANY

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STATE

bestos-Manhattan. One may appear in 1960, but M-E-L Div. sources indicate it still hasn't been tested enough to warrant release.

Talk about disc brakes is just talk. The industry hasn't been able to develop or license a workable design within required cost limits.

• **Engines** — Present powerplants are close to capacity displacement, but with the economy pitch still on, designs are adequate for 1960 and probably 1961. By then, volume lines should have an aluminum block. American Motors Corp. is also considering it. Besides routine head and valve train programs, the other major engine change for next year is a proposed redesign of Plymouth's 6 cylinder job: It has been virtually untouched for 20 years.

Detroit has been muttering about the story that Ford is considering a V-5 engine (two cylinders on each side and one centered in the rear). The report comes from extremely reliable sources, but autodom still thinks it's a joke. Several V-5 engines have been proposed before, and some prototypes have been built, but design and manufacturing problems have been too great to warrant a changeover.

• **Components** — The alternating current generator originally planned for '59 is supposedly set for 1960.

Dual headlights will continue through '60 because present tooling still isn't amortized. There's talk of a rectangular headlight being developed by General Electric Co. It may appear next year because it requires relatively little retooling. The long look seems to be that single headlights will return in 1961 or '62, say sources at GM's Delco-Remy Div. They claim this cost saving change will be possible with multiple beam lamps recently announced by GE.

• **Way Back When** — Small cars are still something of a question mark. Ford is waiting for GM, and GM is waiting to see how 1959 models sell. Several self-styled experts assume that GM will lose interest in an American built economy car if its big models are hot.

But the recession unearthed a growing consumer desire for a more economical car. Ford, Chevrolet, and Plymouth have made room for one in their lineups. Engine tooling has been released. Even Chrysler has ordered $95,000 worth of diecasting dies for aluminum engine parts.

If import sales continue to take 8 or 9 per cent of the market in November and December (they accounted for 11.5 per cent of September's sales), one GM official says his company probably will decide to go ahead with its small car program.

U. S. Auto Output

Passenger Only

	1958	1957
January	489,357	642,090
February	392,112	571,098
March	357,049	578,826
April	316,503	549,239
May	349,474	531,365
June	337,355	500,271
July	321,053	495,628
August	180,324	524,354
September	130,426	283,852
October	261,696	327,363
10 Mo. Total	3,135,349	5,004,086
November		578,601
December		534,714
Total		6,117,400

Week Ended	1958	1957
Oct. 18	45,387	72,180
Oct. 25	70,973	104,987
Nov. 1	97,804	126,139
Nov. 8	125,279	136,742
Nov. 15	118,915†	141,904
Nov. 22	135,000*	151,846

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

Nylon Auto Parts Increase

Almost 250 automotive parts are made from nylon resin, declares E. I. du Pont de Nemours & Co., Wilmington, Del. The 40-odd nylon parts used in the average 1959 car weigh less than a pound.

Items like dome lamp covers have been used for at least ten years, but this year marks the introduction of several new nylon parts. Some of them are of new design, but several replace metal parts.

Examples: The extruded nylon gas bags Cadillac is using in its gas filled shock absorbers; extruded nylon tubing in Cadillac's air suspension systems; and pushbutton covers for Chrysler components. Other uses, new this year, are vacuum spark lines and transmission selector switch housings. Nylon fuel lines may be introduced next year, adds Du Pont.

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Allied's new Irilac #1000 is a concentrated solution of a water-soluble polymer with built-in complex corrosion inhibiting materials. It was developed to answer the needs of the metalworking industry for a non-conversion process that will provide corrosion resistance and resistance to fingerprinting and abrasion on base metals and electrochemically or chemically finished surfaces—without changing the appearance of the metallic surface.

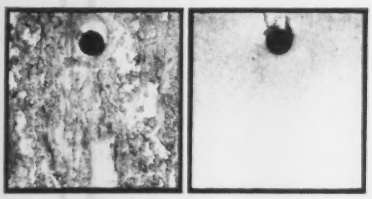
There are no hazards involved—Irilac is non-fuming, non-toxic, and requires no special fire prevention measures.

THE PROCESS

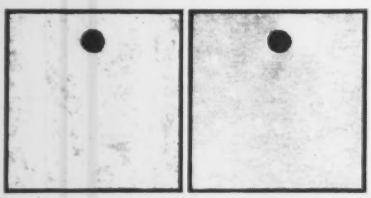
Irilac #1000 is diluted with water to provide a simple one-pass working solution. It is then applied by dip, brush or spray and forms a coating that quickly *bonds* to the metal surface without reacting with the surface.

THE PROPERTIES

The resulting coating is clear, transparent, thin yet durable. It has excellent water-resistant properties, and can be rubbed, handled and subjected to rough treatment. The surface to which Irilac has been applied is not altered—in fact, the transparent coating brings full tone to colored surfaces and clarity to iridescent surfaces. The water-thin physical characteristic of the solution means that the coating provides protection in recessed areas that are difficult, if not impossible, to protect with other methods.



STEEL PANELS: bare (left) and coated with Irilac (right) after 8-hour salt spray.



ALUMINUM PANELS: bare (left) and coated with Irilac (right) after 168-hour salt spray.

WHERE IRILAC CAN BE USED

Irilac #1000 can be applied to *any* metal—wet or dry—treated or untreated. All metals can be processed in *one* operation in the same solution. It can be applied in conjunction with any process—over Iridite, anodized, phosphated surfaces, black oxide, etc. Surfaces treated with Irilac provide a good base for paint.

APPLICATION ADVANTAGES

No other process or material available for the protection of metals offers all the application advantages found in new Irilac #1000:

1. It can be applied to *any* clean metal simply by dip, brush or spray. No special equipment is required.
2. Saves time—just apply and dry—no reaction time required.
3. No hazards involved—no exhaust or special fire protection equipment is required. Irilac is non-fuming and non-toxic.
4. Saves space. Presents no disposal problem. Low in first and final costs.

Because of its versatility and complete safety, Irilac has unlimited uses. For example, it will protect aluminum furniture, brass hardware and fixtures, steel parts of all types, zinc castings, etc. In fact, any base metal or plated surface, or those treated with electrolytic or chemical post-treatments, can be improved or enhanced with Irilac.

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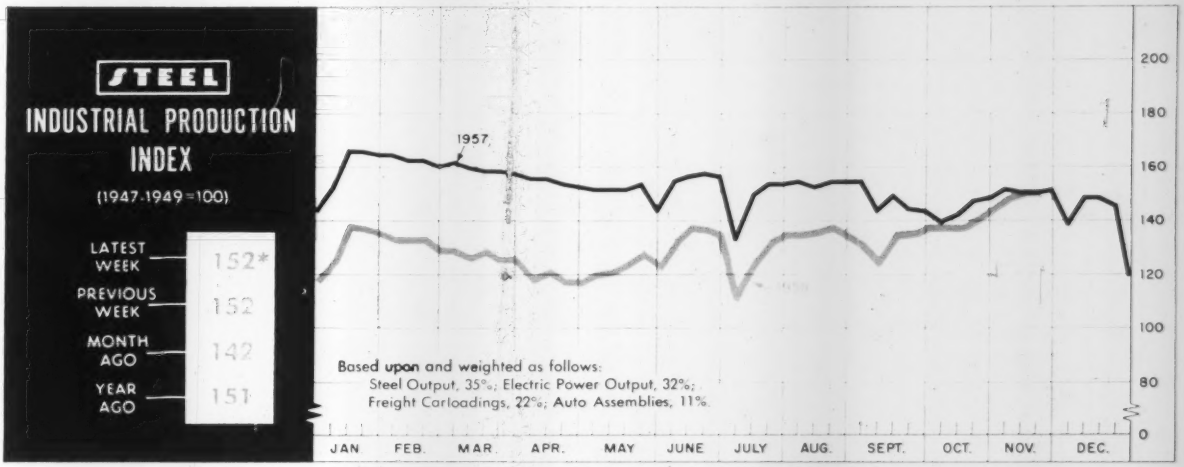

*Week ended Nov. 15.

Peace in Motordom: Rx for Recovery

DESPITE LABOR TROUBLES, the recovery has kept on the right track, but its speed has been throttled by one walkout after another. If the major causes of unrest have finally been smoothed out, the gains in November and December will be the most spectacular since the recovery in 1955.

One begins to wonder what the fourth quarter would have been like if production had been allowed to run its course. The latest report from the Federal Reserve Board hikes the industrial production index to 138 per cent of the 1947-49 average, a scant 1 point rise over the September level. It could have jumped to about 140 under more favorable conditions.

• **Levels Out** — Time and again, STEEL's index (above) has been on the verge of swinging up sharply, only to be slowed down or stopped dead by labor troubles. The latest disturbances in the motor industry were largely responsible for a preliminary reading of 152 (1947-49=100) for the week ended Nov. 15, no change from the previous week.

Ordinarily, the October-November period is noted for a seasonal upsurge in production. Last year, when the recession was in full force, the increase was held to a less-than-seasonal 11 points through mid-November. This year, when the recovery is supposedly in full swing, the gain has been only 13 points. Indications are that the rest of November will finally come up to expectations. Since our index is usually reflected in the later FRB index figure, it's a good bet that the board will report at least 140 for November.

• **Cause of It All**—The economy is basically strong. Demand is on the uptrend as evidenced by the reports of new orders and shipments by the Commerce Department, purchasing agent associations, and companies. But Labor Department figures show that more workers participated in strikes in September than in any month since

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,005[1]	2,011	1,945
Electric Power Distributed (million kw-hr)	12,375[1]	12,311	11,953
Bituminous Coal Output (1000 tons)	8,540[1]	8,575	9,519
Crude Oil Production (daily avg—1000 bbl)	7,000[1]	7,003	6,831
Construction Volume (*ENR*—millions)	$374.3	$221.5	$373.0
Auto, Truck Output, U. S., Canada (*Ward's*)	149,960[1]	158,138	173,383
TRADE			
Freight Carloadings (1000 cars)	630[1]	658	647
Business Failures (Dun & Bradstreet)	331	299	266
Currency in Circulation (millions)[3]	$31,660	$31,419	$31,287
Dept. Store Sales (changes from year ago)[3]	+2%	+5%	−1%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$20,094	$21,712	$20,019
Federal Gross Debt (billions)	$280.2	$280.2	$273.7
Bond Volume, NYSE (millions)	$39.8	$29.5	$25.9
Stocks Sales, NYSE (thousands of shares)	20,790	15,920	11,671
Loans and Investments (billions)[4]	$93.9	$93.9	$86.3
U. S. Govt. Obligations Held (billions)[4]	$31.5	$31.6	$25.0
PRICES			
STEEL's Finished Steel Price Index[5]	247.82	247.82	239.15
STEEL's Nonferrous Metal Price Index[6]	217.3	217.2	206.4
All Commodities[7]	118.8	118.7	117.8
Commodities Other than Farm & Foods[7]	126.3	126.2	125.6

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1958, 2,699,173; 1957, 2,559,490. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

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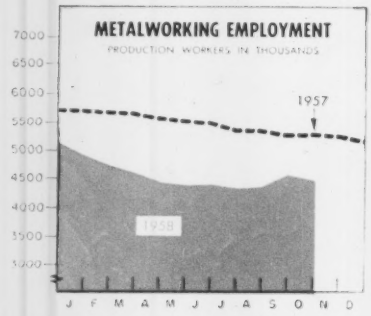
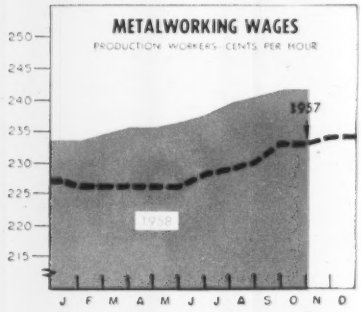
THE BUSINESS TREND



1957	Prim. Mtls.	Fab. Prod.	Mach-inery	Elec. Mchy.	Trans. Equip.
Oct.	1,051	897	1,204	868	1,316
Nov.	1,029	887	1,141	852	1,350
Dec.	1,006	868	1,122	824	1,342
1958					
Jan.	957	833	1,097	792	1,276
Feb.	911	800	1,072	765	1,214
Mar.	885	786	1,090	749	1,153
Apr.	849	766	1,061	729	1,103
May	840	756	1,029	715	1,081
June	859	773	1,014	716	1,084
July	852	765	990	712	1,063
Aug.	864	788	977	734	1,034
Sept.*	898	820	1,013	759	1,099
Oct.*	918	812	1,014	755	1,001

*Preliminary.
U. S. Bureau of Labor Statistics.



1957	Prim. Mtls.	Fab. Prod.	Mach-inery	Elec. Mchy.	Trans. Equip.
Oct.	255	222	233	208	247
Nov.	255	223	234	210	250
Dec.	255	221	234	211	248
1958					
Jan.	256	222	234	212	246
Feb.	256	222	235	214	246
Mar.	257	223	236	214	248
Apr.	257	224	236	214	247
May	258	225	237	214	250
June	261	227	237	215	251
July	267	228	238	215	252
Aug.	270	229	237	215	254
Sept.	272	229	239	216	255
Oct.*	272	229	240	216	253

*Preliminary.
U. S. Bureau of Labor Statistics.

Charts copyright, 1958, STEEL.

the mid-1956 steel strike. The trend apparently continued into October, holding back such industries as automotive, glass, and farm machinery.

Chrysler Corp. reportedly lost close to 14,000 units in its November schedules because of the strike by office workers. American Motors Corp. lost several days of production because of a strike at Budd Co., a supplier of auto body stampings. The losses probably will result in heavier schedules for the rest of November and December. Dealers are already short of many new models because of earlier strikes. The situation has hindered sales of new cars, which averaged only 11,600 a day during the first ten selling days of this month.

• **Chain Reaction**—The secondary effects of the situation can be seen in other parts of the economy. Steel mills, whose operations had been expected to hit 80 per cent of capacity by the end of this month, have been held at around 75 per cent for six weeks. Stampers report that the uncertainty in the auto industry has hurt their new order position, although some say that sales are starting to pick up.

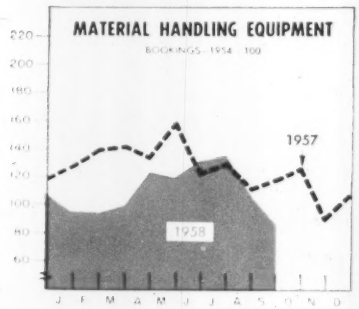
Labor figures for October pinpoint the blame for the lackluster showing of the recovery. The Department of Labor reports that most job statistics showed seasonal improvement or better last month except in the hard goods industries which were hit by labor disputes. The graph above shows that metalworking employment had been climbing slowly since July, but it edged back about 89,000 during October.

• **Earnings Slip**—Although average hourly earnings remained at a record level (see graph above for metalworking's wages), work stoppages resulted in the first decline in personal income in eight months. The annual rate in October was $357.5 billion, off slightly from September's record of $357.8 billion.

With the return of full-time operations at Chrysler and AMC, it appears for the first time since late summer that the automotive industry is set to put its full strength into the recovery. The labor scene should be fairly peaceful until mid-1959 when the steelworkers could temporarily halt the upswing.

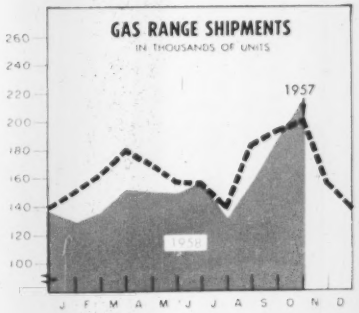
Some Buck the Trend

While the recovery is broadly based, not all industries are going



	1958	1957	1956	1955
Jan.	93.07	126.34	122.43	97.00
Feb.	93.49	139.29	129.56	98.71
Mar.	97.89	140.76	166.14	149.16
Apr.	122.36	132.67	145.20	109.52
May	118.04	157.95	155.53	110.50
June	131.15	121.57	189.13	139.00
July	134.34	128.31	165.50	111.76
Aug.	104.46	110.09	168.70	106.20
Sept.	85.41	116.79	130.35	136.80
Oct.	.....	124.80	143.38	123.52
Nov.	.....	87.80	138.50	118.09
Dec.	.....	105.65	117.76	139.85
Avg	.....	124.34	147.68	120.01

Material Handling Institute Inc.



	Shipments—Units		
	1958	1957	1956
Jan.	128,400	149,600	163,500
Feb.	134,500	161,600	190,200
Mar.	149,400	179,400	194,300
Apr.	148,300	168,800	176,300
May	147,300	156,200	179,400
June	155,800	155,300	185,100
July	129,300	137,400	158,800
Aug.	157,500	182,600	203,200
Sept.	186,900•	192,100	206,400
Oct.	215,400•	195,500	219,100
Nov.	.....	154,300	161,100
Dec.	.....	135,800	138,700
Totals	.....	1,970,900•	2,176,100

•Preliminary.
Gas Appliance Mfrs. Assn.

up at an even rate, and a few are not going up at all. One of the most notable soft spots is in the foundry equipment segment of metalworking. In September, orders for new equipment dropped to 65.5 per cent of the 1947-49 base period, compared with 74.1 in August and 113.9 in the year-ago month, says the Foundry Equipment Manufacturers Association. It was the third lowest level of the recession.

After reporting signs of a vigorous recovery during the midyear months, members of the Material Handling Institute Inc. say that bookings in September plummeted to 85.41 (1954 = 100), the lowest level since the base period was adopted. (See graph above.)

Construction Booms Again

The one industry that keeps charging along at record breaking speed—construction—looks like it is going to continue unabated into 1959. Last week's outlook report from the Departments of Commerce and Labor holds out the prospect for record spending of $52.3 billion for new construction next year. That would be a whopping 7 per cent above the expected $48.8 billion for 1958 and would represent physical as well as dollar gain. The fact that spending will increase should come as no surprise (see STEEL, Nov. 3, p. 42), but the size of the boost will raise some brows.

Next year's work put in place will be determined largely by this year's contract awards, which are well ahead of the 1957 pace. (F. W. Dodge Corp. anticipates a 3 per cent gain. Figures from *Engineering News-Record* are currently running 6 per cent ahead.)

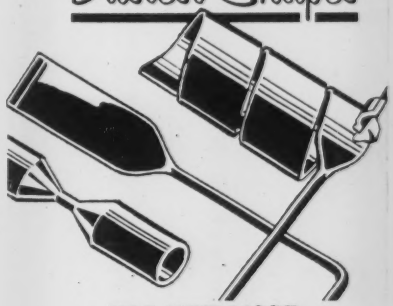
The latest government report represents an upgrading of estimates released earlier for STEEL. The unusually strong showing of contract awards in September may have influenced the higher figures.

Trends Fore and Aft

• Executives from eight of the nation's leading department stores believe sales during the final quarter will offset recession losses earlier in the year, declares Commercial Factors Corp. (Government figures show sales have been in the plus column for the last six weeks. See Barometers of Business, Page 75.)

• October shipments of gas ranges (see graph above) were at their highest monthly level in two years.

TMI Tubing Gets into the Busiest Shapes



FOR THE MOST IMPORTANT DESIGNING REASONS

From explorations into space itself to applications within mechanical "corrals" so minute that space is as critical a requirement as performance . . . TMI Tubing is busiest when the demands are most selective.

When you want *more* of small diameter stainless steel and special alloy tubing . . . and any combination of split-thousandth tolerances, micro-finishes and exotic stainless alloys . . . TMI is ready and able to build it for you.

The Mark of Quality TMI

The standard range of quality production at TMI—.050″ to .625″ O.D. with tolerances as close as .0005″ when required. Larger sizes to 1.25″ O.D. accepted on strict custom basis.

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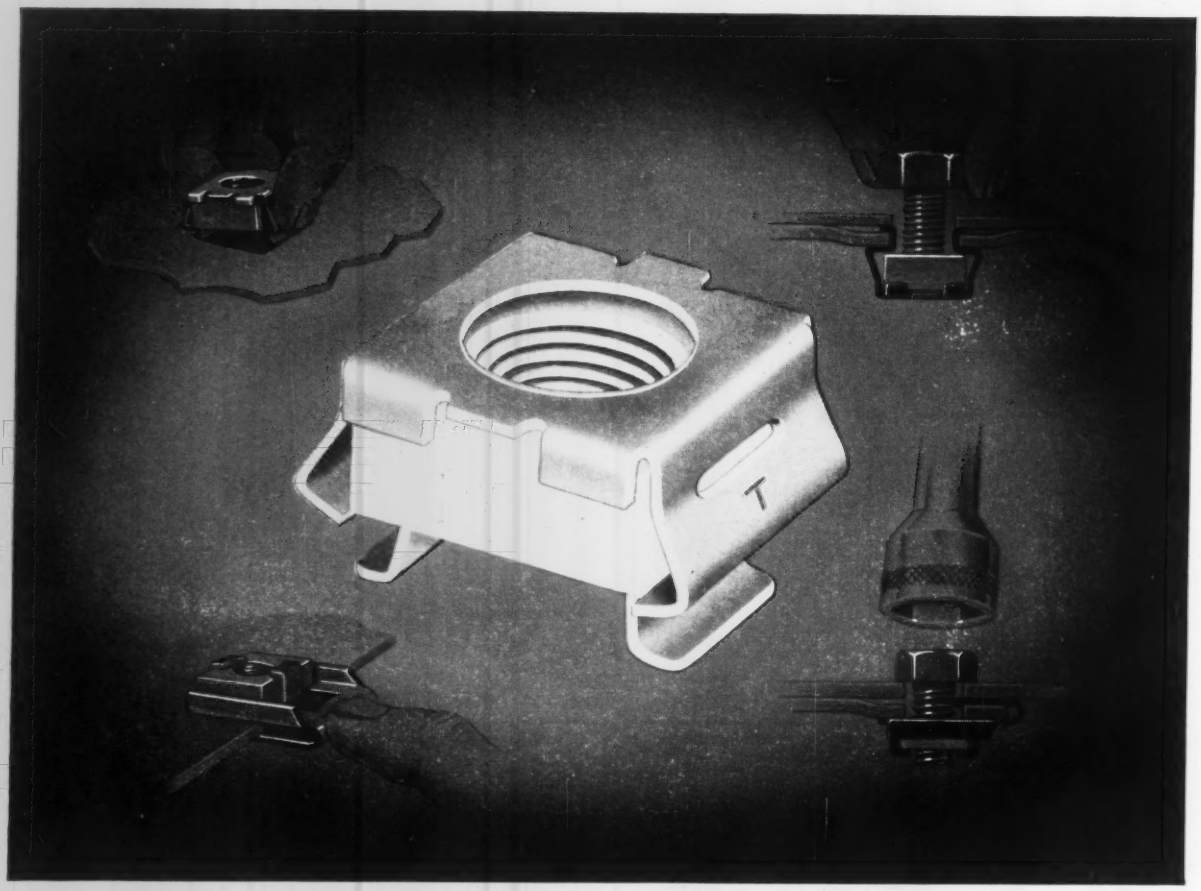
METALLURGISTS • ENGINEERS • MANUFACTURERS

BRIDGEPORT (Montgomery County), PA.



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Nut-in-a-cage eliminates welding or staking...
SPEED GRIPS® hold themselves on panels!

Wherever you require a heavy-duty, multi-thread, self-retaining fastener, a Tinnerman SPEED GRIP Nut Retainer answers the need, holds down assembly costs.

SPEED GRIPS snap into place . . . some into panel holes . . . others over panel edges. No special tools or skills required. Spring-steel fingers grip the panel, yet let the nut float to compensate for normal panel-hole misalignment. Welding, staking and clinching are eliminated. SPEED GRIPS can even be applied after panels have been finished, avoiding paint-clogged threads.

SPEED GRIPS are available in a wide range of sizes and types, including front-mounting nut and bolt retainers for hard-to-reach or blind locations.

See your Sweet's Product Design File, section 8-T for data on these and other SPEED NUT Brand Fasteners. Your Tinnerman representative has complete information and samples. If he isn't listed under "Fasteners" in your Yellow Pages, write to:

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Speed Nuts®

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WILLIAM R. HEATH
Buffalo Forge president

F. G. FABIAN JR.
Dresser Mfg. president

ARTHUR C. WESTROM
Hubbard eng.-research post

HENRY J. EGEN JR.
Philco appointment

William R. Heath was elected president, **Buffalo Forge Co.**, Buffalo. He succeeds **Edgar F. Wendt**, who retires after 47 years with the company, 29 as president. Mr. Heath was executive vice president.

F. G. Fabian Jr., former general manager, was elected president of **Dresser Mfg. Div.**, Bradford, Pa., Dresser Industries Inc.

Herman L. Schrock Jr., a vice president, was elected president, **Hoover Ball & Bearing Co.**, Ann Arbor, Mich. **Clifford H. Simmons**, chairman and president, was re-elected chairman and named chief executive officer. **William L. Brittain**, former executive vice president, was elected vice chairman, and chairman of the management committee.

Edwin S. Lawrence was made manufacturing manager for **General Electric Co.'s** Everett, Mass., foundries. He is succeeded as manager-manufacturing engineering at the Schenectady, N. Y., foundries by **Charles J. Lauckner III. Martin J. O'Brien Jr.**, previously manager-manufacturing at Everett, was named to the new post of manager-steel foundry expansion, Schenectady.

Lonnie L. Holder was made sales manager, metalworking machinery division, **Wysong & Miles Co.**, Greensboro, N. C.

Donald E. Stocking was made sales manager, Rochester, N. Y., division, **Consolidated Electrodynamics Corp.** He was Buffalo district sales manager.

Arthur C. Westrom was made director of engineering, research, and development at **Hubbard & Co.**, Chicago. He succeeds **Clarence H. LeVee**, resigned. Mr. Westrom was assistant research director; also director of research-electrical apparatus.

Walter W. Tangeman retired as chairman, **Cincinnati Milling Machine Co.**, Cincinnati, on completing 50 years of service with the company. He continues as a director. **Frederick V. Geier** was elected chairman and chief executive officer. **Swan E. Bergstrom** was elected president.

William Fulton, engineer, was made plant manager, **Basford Mfg. Co.**, Santa Cruz, Calif.

Roy C. Norton Jr. was named chief engineer, **Saco-Lowell Automotive Div.**, Saco, Maine, Saco-Lowell Shops. He held a similar position with Long Mfg. Div., Borg-Warner Corp.

Ray V. Clute was made assistant to the vice president-sales, **Huck Mfg. Co.**, Detroit. He was western division sales manager.

Monroe G. Smith was elected a vice president, **Electric Storage Battery Co.**, Philadelphia. He continues direction of the industrial division, and Jessall Plastics Div.

Andrew M. Mitchell was made director of engineering and manufacturing, **Youngstown Steel Car Corp.**, Niles, Ohio. He was superintendent of Taylor Forge & Pipe Co.

Henry J. Egen Jr. was named manager-tool engineering and metal fabrication for **Philco Corp.'s** government and industrial division, Philadelphia. He was chief tool engineer for Mergenthaler Linotype Co.

John R. Howland, general sales manager, Dage Television Div., Thompson Products Inc., was made sales manager-closed circuit television, and product control equipment for **Philco Corp.'s** government and industrial division, Philadelphia.

Carrol J. Harney was made sales manager, **Swepco Tube Corp.**, Clifton, N. J. He was assistant sales manager.

Frank R. Meyer was appointed Detroit district sales manager, **Wheeling Steel Corp.** He succeeds **Harrold M. Pierce**, retired.

William R. McLain was made division superintendent, steel production, at the South Works, Chicago, **U. S. Steel Corp.** He succeeds **Michael F. Yarotsky**, retired. **John E. Harrod** succeeds Mr. McLain as assistant division superintendent.

Charles P. Greenlee was named manager, manufacturers' products sales, Cleveland; **Edmond J. Walsh**, manager of sales in Detroit for **American Steel & Wire Div.**, U. S. Steel Corp.

Thomas J. Marshall was made sales manager, **Federal-Mogul Div.**, Federal-Mogul-Bower Bearings Inc., Detroit. Former assistant sales man-

ROSS WILKINS JR.

W. H. C. WEBSTER

Great Lakes Steel management positions

GEORGE J. DOWNING

JAMES A. HELBLING

Republic Steel appointments

ager, he succeeds **Kenneth W. Warren,** resigned.

Great Lakes Steel Corp., Ecorse, Mich., division of National Steel Corp., appointed **Ross Wilkins Jr.** assistant to the president; **W. H. C. Webster,** vice president - sales. Former sales vice president, Mr. Wilkins assumes responsibility of customer relations in advance planning of product distribution. Mr. Webster was vice president-administration.

Solar Aircraft Co. established its Des Moines, Iowa, operations as a fully integrated division of the company. **Bruce A. Willsey,** former manager of the Des Moines plant, was elected vice president and general manager of the division.

Samuel R. Hoffman, former assistant to the chairman of **H. K. Porter Company Inc.,** was named assistant to the vice president-treasurer of **Jessop Steel Co.,** Washington, Pa.

Robert V. Simpson joined **Birdsboro Steel Foundry & Machine Co.,** Birdsboro, Pa., as railway and industrial sales engineer. He was with Hyatt Bearings Div., General Motors Corp.

Dr. A. L. Feild, R. L. Davidson, and **K. Oganowski** were named directors of activities in the research division of **Armco Steel Corp.** Dr. Feild, now director of stainless steel research, will continue to head the Baltimore laboratories, where he was formerly associate director of stainless steel research. Mr. Davidson will direct chemical research; Mr. Oganowski, metallic coatings research. Both are former associate directors. They continue headquarters in Middletown, Ohio.

Ray T. Knight joined **Fleming Steel Co.,** New Castle, Pa., as assistant sales manager. He held a similar post at Truscon Steel Div., Republic Steel Corp.

S. William Riley, former chief project engineer, was appointed chief engineer for **Quaker Rubber Div.,** Philadelphia, H. K. Porter Company Inc.

Dr. Howard L. Gerhart was made director of research and development for the paint and brush division of **Pittsburgh Plate Glass Co.,** Pittsburgh.

Jones & Laughlin Steel Corp. appointed three in management of its container division plants: **Elliott H. Thomas** was named manager, Cleveland plant. He is succeeded by **Neil E. Geisler** as manager of the Lebanon, Ind., plant. **W. Samuel Klingensmith** was made Atlanta plant superintendent. He was acting plant manager.

George J. Downing succeeds **Walter L. Radley,** retired, as chief combustion engineer of **Republic Steel Corp's** Buffalo steel plant. **James A. Helbling** was appointed metallurgist for the tin plant sales division in Cleveland.

Albert Lewis was made director of industrial relations for **C. A. Norgren Co.,** Englewood, Colo. He held a similar position in Cincinnati for Gruen Watch Co. For the last year, he has been executive director and secretary for the Mechanical Contractors Association, Cincinnati.

Radio Corp. of America, New York, appointed **L. Harriss Robinson** manager of marketing, surface communications department, RCA Defense Electronic Products, Camden, N. J.

George W. Hoagland was made manager of manufacturing for **Auer Register Co.,** Cleveland. He was plant superintendent for Newart Mfg. Co.

Walter C. Rowley was named as-

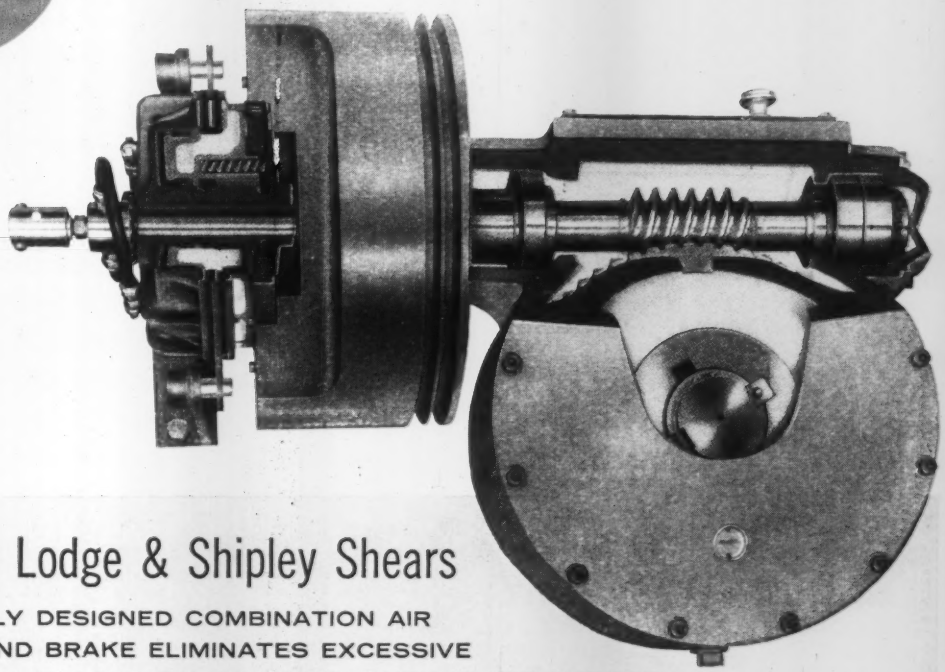
ELLIOTT H. THOMAS

NEIL E. GEISLER

W. SAMUEL KLINGENSMITH

management posts for J&L's container division

EXTRAS on the machine . . . not on the invoice!



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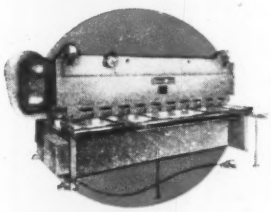
...SPECIALLY DESIGNED COMBINATION AIR CLUTCH AND BRAKE ELIMINATES EXCESSIVE MAINTENANCE COMMON ON HEAVY DUTY PLATE SHEARS

The "standard extras" you find on Lodge & Shipley Shears, although not reflected in the price, are important in time-saving, effortless operation, accuracy and low-cost service.

THE COMBINATION AIR CLUTCH AND BRAKE, for example . . . its single unit design positively eliminates overlap between clutch and brake. Disc-type construction is self-adjusting for fast, smooth starting and safe, positive stopping. The clutch provides automatic overload safety; the brake applies automatically in the event of electrical or air supply failure.

NO OTHER SHEAR, EVEN AT EXTRA COST, can offer the exclusive combination of features found, for instance, on the ½" Lodge & Shipley Shear: • 2-stage Hydraulic Holddown System • Remote-operating Foot Control • Motorized Front-Operated Back Gauge • One-piece Shaft with Integral Eccentrics • Ball Transfer Table • Blade Clearance Indicators • Air Counterbalances • Air-cushioned Back Gauge • Blade Changing Jigs • Fast, One-man Upper Blade Adjustment • Independent Holddown Fingers • Quad-life Worm Gear.

Find out how much more you get . . . **WITHOUT EXTRA COST** . . . on a Lodge & Shipley Shear. For details, see Sweet's Machine Tool File or request Bulletin No. PS-15 from: **The Lodge & Shipley Co., 3070 Colerain Ave., Cincinnati 25, Ohio.**



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M. WHITNEY NESBITT
Pesco Products v. p.-sales

LEO W. TOBIN JR.
AC Spark Plug mgr.

EUGENE A. NEDWICK
Peterson Steels div. mgr.

CHARLES F. MYERS
Van Norman exec. v. p.

N. WILLIAM MULLER
Great Lakes Carbon v. p.

CARL W. NELSON
Toledo Desk v. p.

sistant manager of **Electric Steel Foundry Co.'s** Danville, Ill., plant.

Charles F. Myers was elected executive vice president of **Van Norman Industries Inc.**, Springfield, Mass. He is presently head of the Morse Twist Drill & Machine Co. Div., New Bedford, Mass. **Herbert I. Segal**, president of Van Norman Industries, announces his retirement, effective Jan. 5, 1959.

Pangborn Corp. named **Leonard W. Wagner** district sales manager at Augusta, Ga.

John L. Cohill was elected vice president-special assignments, a new post at **Firestone Tire & Rubber Co.**, Akron. He is succeeded as vice president of all company subsidiaries (other than tires) by **L. J. Campbell. Mario Di Federico** succeeds Mr. Campbell as president of Firestone Steel Products Co. He was vice president-sales of the company. **J. J. Robson** succeeds the late **Walter E. Lyon** as director of tire engineering and development.

N. William Muller was appointed a vice president of **Great Lakes Carbon Corp.**, New York, and general manager of its research and development department. He succeeds the late **Dr. Samuel W. Martin.** Mr. Muller has headquarters at Great Lakes's general office in Chicago. The research center is situated at Morton Grove, Ill.

Carl W. Nelson was made vice president and general manager, **Toledo Desk & Fixture Co.**, Maumee, Ohio. Mr. Nelson had been with Crane Co. for 17 years, and was plant manager of its division, Toledo Desk & Fixture, before it was purchased in August by **Harold C. Schott**, president, and his associates.

Lewis W. Lubenow was made field sales manager, Semi-Bulk Materials Handling Div., **Powell Pressed Steel Co.**, Youngstown.

Charles H. Lilly was made liaison engineer for **W. L. Maxson Corp.'s** Old Forge, Pa., manufacturing division.

M. Whitney Nesbitt was made vice president-sales, **Pesco Products Div.**, Bedford, Ohio, Borg-Warner Corp. He was director of engineering at Pesco, which he joined in 1954.

Leo W. Tobin Jr. was made manager of Milwaukee operations of **AC Spark Plug Div.**, Flint, Mich., General Motors Corp. **Algie A. Hendrix** was named to the new post of assistant manager for AC-Milwaukee operations. Mr. Tobin was chief engineer of automotive products for AC in Flint.

Martin J. Caserio was made general manager, **Delco Radio Div.**, Kokomo, Ind., General Motors Corp. He succeeds **Berry W. Cooper,** who is on special assignment pending his retirement in January. Mr. Caserio was manager of the Milwaukee operations of AC Spark Plug Div.

Eugene A. Nedwick was made manager, strip steel division, **Peterson Steels Inc.** Headquarters for the division were established last July at Melrose Park, Ill. Mr. Nedwick was formerly assistant midwest sales manager for Sandvik Steel Inc.

James Vrungos was appointed manager of marketing, **Electronic Control Systems,** Los Angeles, Stromberg-Carlson Div., General Dynamics Corp.

G. V. Middaugh was made manager of **Koppers Co. Inc.'s** gas apparatus department and the consolidated coke oven department, Baltimore. He succeeds **George C. Pfaff,** who retires as manager, gas apparatus.

OBITUARIES...

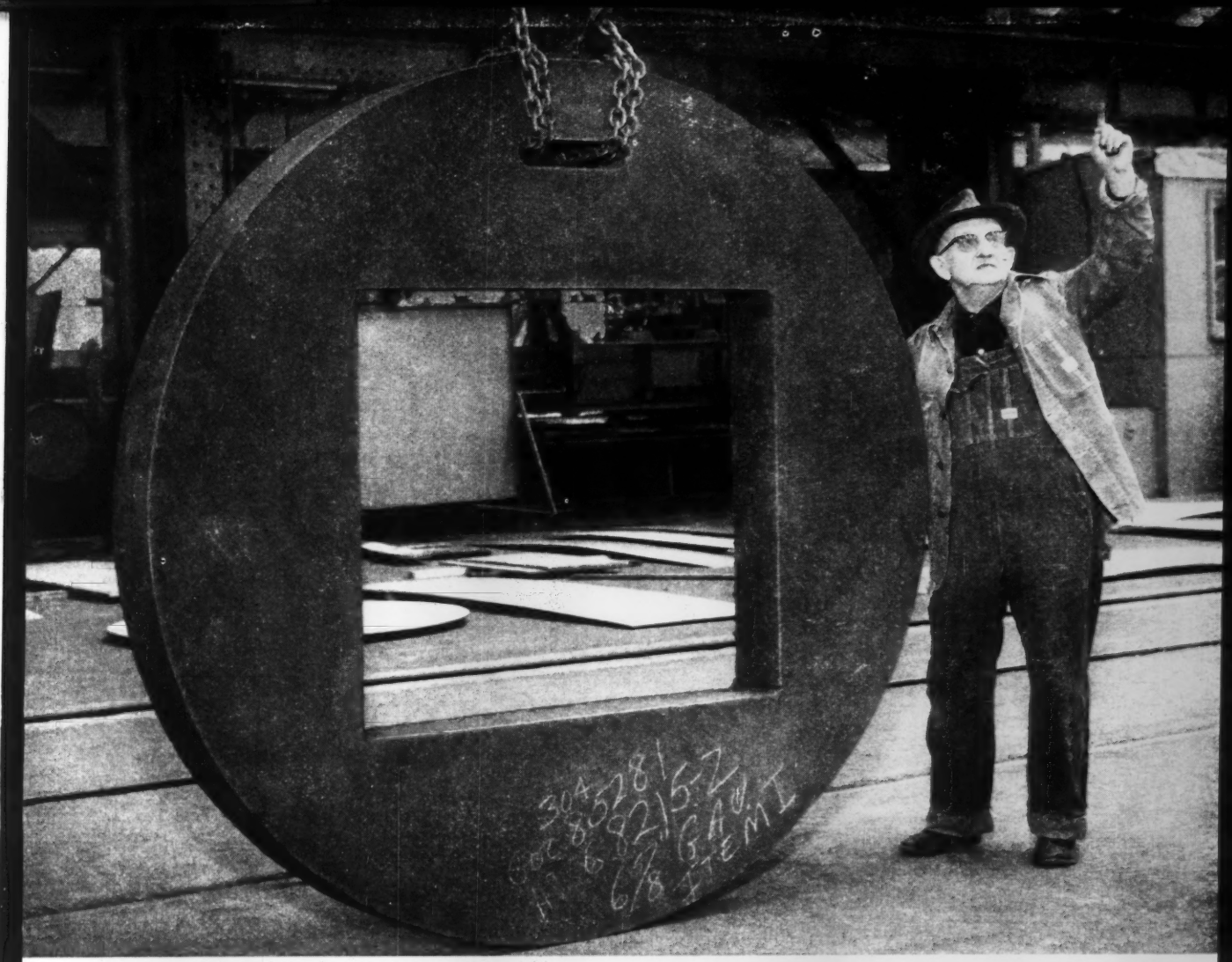
James K. Watkins, 64, chief engineer, Midland, Pa., Works, **Crucible Steel Co. of America,** died Nov. 13.

Harvey J. Clewell, 62, purchasing agent, **Phoenix Metal Cap Co.,** Chicago, died Nov. 13.

Russell C. Fish, vice president, **M. A. Hanna Co.,** Cleveland, died Nov. 12 in Grand Rapids, Minn.

W. B. Nixon, 47, supervisor of consumer product markets, **Armco Steel Corp.,** Middletown, Ohio, died Nov. 12.

Victor F. Stine, 65, president, **Pangborn Corp.,** Hagerstown, Md., died Oct. 29.



Type 304 stainless plate, dimensions: 6⅝" thick x 75" diameter. Weight, 8655 lbs.

take a look

...at the clean edges of this stainless plate accurately cut by Carlson

THIS stainless plate illustrates something that's almost a Carlson exclusive. Few producers can make plates of such heavy gauge, and fewer still have the long experience in flame cutting stainless to precise dimensions. To develop the proper equipment, the exact gas and iron powder formula, and the special nozzles, took Carlson engineers years of effort. But the result was worth it.

The edges achieved by these improvements reduce the cost of subsequent machining operations. And every Carlson stainless plate—whether heavy or light gauge—carries its own identification. Its chemical and physical properties are known and recorded. Its dependable performance on the job is assured.

The complete reliability of every Carlson service will materially reduce your ultimate costs. Our specialists make certain that your instructions are followed in every detail. Write, wire or phone for further information on all our services in stainless steel.

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fatigue-proof™

STEEL BARS

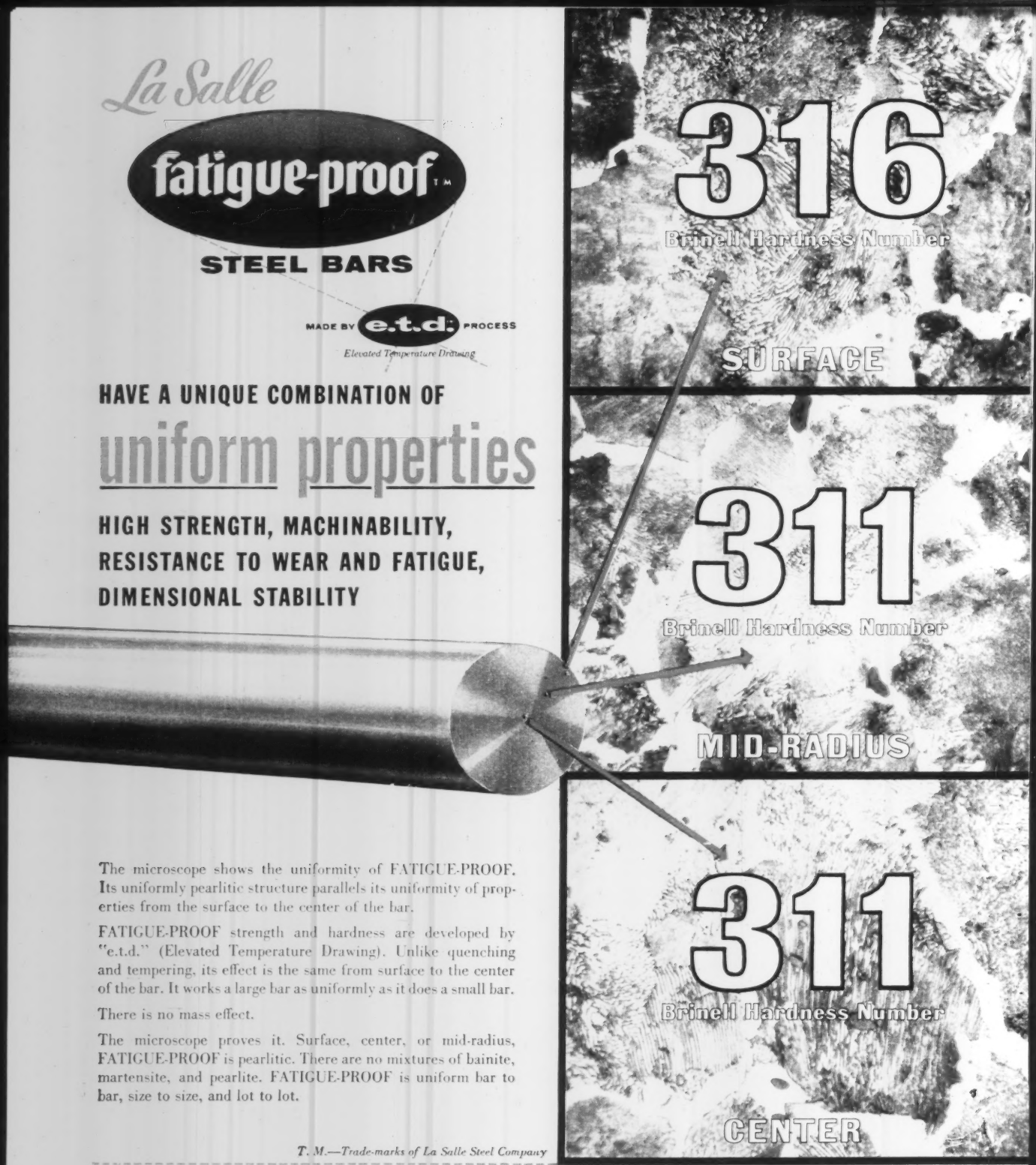
MADE BY e.t.d. PROCESS

Elevated Temperature Drawing

HAVE A UNIQUE COMBINATION OF

uniform properties

HIGH STRENGTH, MACHINABILITY, RESISTANCE TO WEAR AND FATIGUE, DIMENSIONAL STABILITY



The microscope shows the uniformity of FATIGUE-PROOF. Its uniformly pearlitic structure parallels its uniformity of properties from the surface to the center of the bar.

FATIGUE-PROOF strength and hardness are developed by "e.t.d." (Elevated Temperature Drawing). Unlike quenching and tempering, its effect is the same from surface to the center of the bar. It works a large bar as uniformly as it does a small bar.

There is no mass effect.

The microscope proves it. Surface, center, or mid-radius, FATIGUE-PROOF is pearlitic. There are no mixtures of bainite, martensite, and pearlite. FATIGUE-PROOF is uniform bar to bar, size to size, and lot to lot.

T. M.—Trade-marks of La Salle Steel Company

1⅞" round FATIGUE-PROOF. Magnification: 750X

JUST PUBLISHED—Request your copy of 24-page brochure, "A new material" . . . it tells the complete story of FATIGUE-PROOF.

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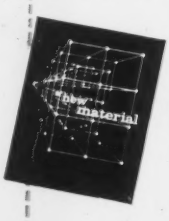


La Salle STEEL CO.

1414 150th Street • Hammond, Indiana

Manufacturers of America's Most Complete Line of Quality Cold-Finished Steel Bars

J&L Extends Expansion Program

New projects include construction of 59 Wilputte coke ovens at Pittsburgh, improved facilities for handling and loading cold-rolled sheets at Cleveland, and a warehouse at Atlanta

JONES & LAUGHLIN Steel Corp., Pittsburgh, is increasing the coke production capacity of its Pittsburgh Works and improving its facilities for customer service at Cleveland and Atlanta.

• **Pittsburgh Works**—A new battery of byproduct coke ovens, consisting of 59 Wilputte ovens, will have a monthly capacity of about 30,000 tons of coke. It is being constructed on the site of an older 60-oven battery which was deactivated in 1953. Construction should be completed in the fall of 1959. The contractor is Wilputte Coke Oven Div., Allied Chemical Corp., New York. The installation also includes additional coal bin capacity and a new quenching station.

J&L is operating six byproduct coke batteries with a total of 379 ovens at the Pittsburgh Works. They have a rated monthly capacity of about 100,000 tons.

• **Cleveland Works**—Plans for the expansion and modernization at the Cleveland Works call for construction of a building to house handling and loading facilities for cold-rolled sheets. Estimated cost: $3.5 million. Construction should be completed in the summer of 1959.

The improvements will consist of product loading and material handling equipment and increased truck and railroad car loading facilities in an enclosed area of more than 105,000 sq ft. The area will be serviced by 30-ton overhead electric cranes, conveyor systems, and other equipment for the rapid shipment of packaged cold-rolled sheets and coils.

Bundles of cold-rolled sheets will be delivered to the new shipping area by a conveyor from Cleveland Works's two, cold-rolled shear lines. Coils will be delivered by overhead crane and convevor systems from the temper mills.

The Cleveland Works has been virtually rebuilt over the last two years. Cost: $90 million. Production of steel for automotive and appliance industries has been doubled through the installation of a new reversing rougher on the 77 in., hot strip mill, a new high-lift blooming mill, a 56 in. temper mill, a new, 4-stand, cold reducing mill, a sintering plant, additional soaking pits, and numerous finishing facilities.

• **Atlanta Warehouse**—The firm's Wire Rope Div. has opened a warehouse at 520 Permalume Place N. W., Atlanta, Ga., under the supervision of Kenneth E. Adams. The facility is a consolidation of the division's warehouses in Savannah, Ga., and Birmingham. It contains 7500 sq ft of space and will handle a full line of J&L wire rope products, says R. M. Feigles, division sales representative for the district. A Fitted & Spliced Dept. will be added soon.

Will Build Trailer Plant

Clark Equipment Co., Buchanan, Mich., will build a factory in Michigan City, Ind., for the manufacture of trucktrailers by its Brown Trailer Div. Cargo Van bodies and shipping containers also will be produced.

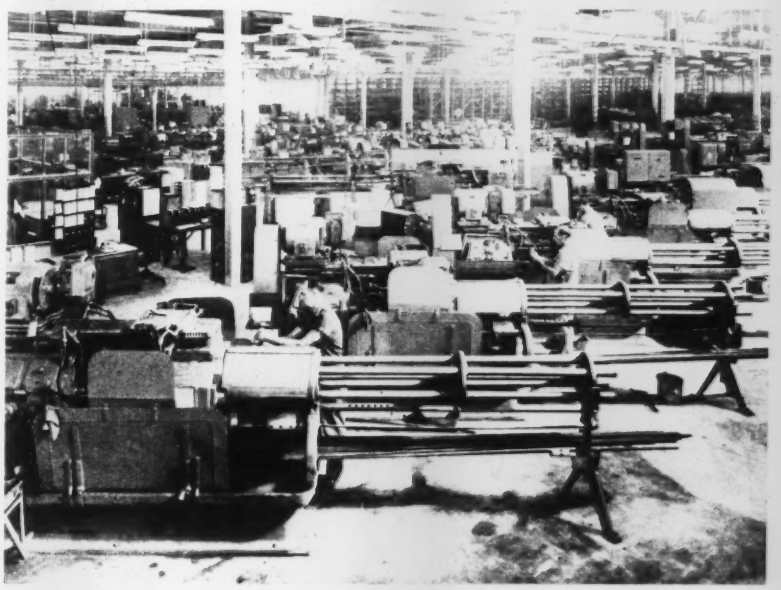
Offers Zinc Diecastings

Litemetal Dicast Inc., Jackson, Mich., producer of magnesium and aluminum diecastings, has added a division for producing zinc diecastings. The Zinc Div. is contained in a building adjoining the firm's main plant. Equipment includes 400 to 600 ton casting machines and trim presses.

Will Reopen Foundry

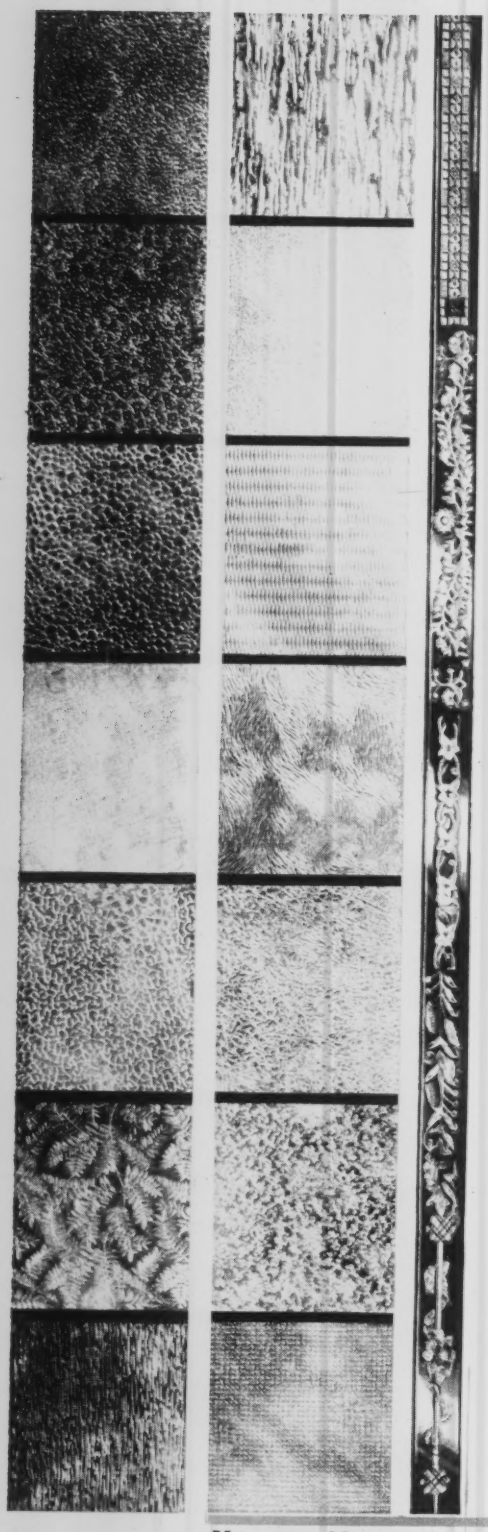
Jamestown Malleable Iron Corp., Jamestown, N. Y., will reopen its plant as soon as maintenance personnel can make necessary preparations. The plant was closed in De-

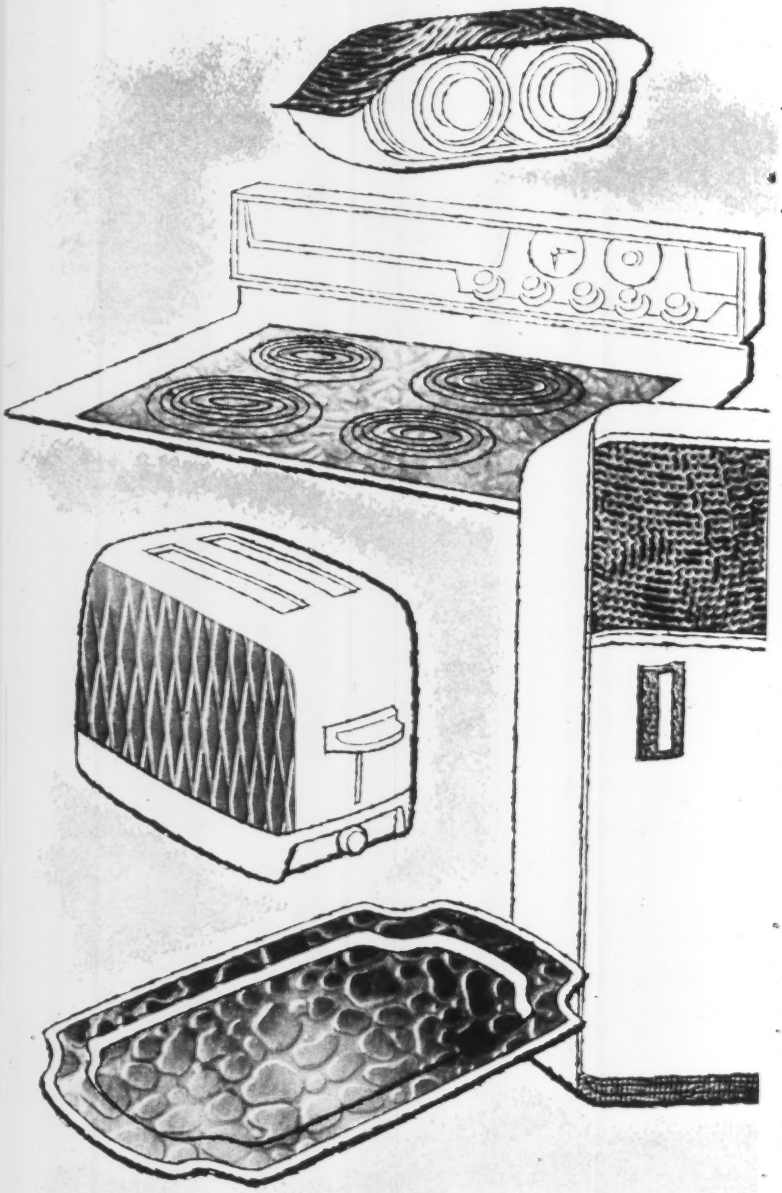
(*Please turn to Page* 88)



ALLEN MFG. CO.'s NEW PLANT at Bloomfield, Conn., is designed for efficiency and expansibility, says M. J. Mather, president. It comprises a 250,000 sq ft factory section (inadvertently stated as 25,000 sq ft in the Nov. 10 issue of STEEL) and a 20,000 sq ft office building. The open, almost partitionless, production layout of the Screw Machine Div. is shown. Here, products not adapted to the firm's heading techniques, are made on automatic screw machines

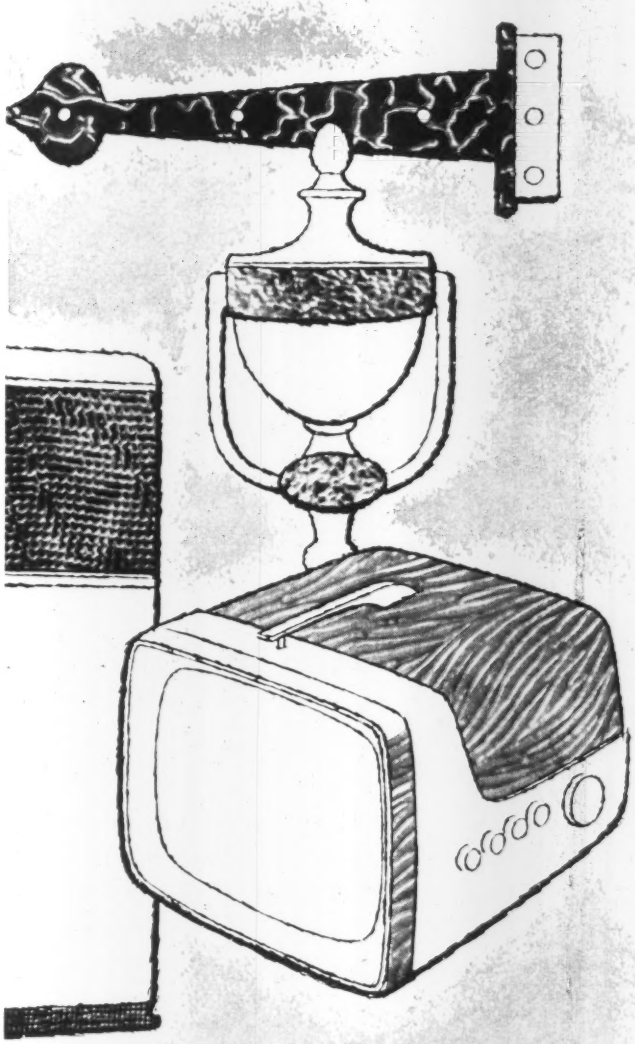
New way to





New patterns . . . Here are 19 new embossed Amerstrip patterns. They can be used on any consumer product made of strip steel, such as: escutcheons, hinges, door knockers, TV and radio cabinets, lamps, table tops, trays, dashboards and kick panels, small appliances, and large appliances.

add beauty and "sell" to consumer products



. . . embossed USS Amerstrip

HERE are just a few examples of the way in which embossed Amerstrip steel can enhance the beauty—and salability—of products made with strip steel. And this is *permanent* beauty . . . beauty you add to your consumer products at low cost.

New embossed Amerstrip is an inexpensive way to add charm and distinction to products because you do not have to apply the pattern; the designs are etched on rolls, then pressed into the strip at our strip mill. Once these patterns are applied, they cannot come off; they are permanently rolled into the steel. A wide variety of new patterns are now at your disposal. Embossed Amerstrip has been experimentally fabricated into products to prove that cold drawing does not affect the pattern. It actually draws easier because the pattern helps hold the lubricant.

Embossed Amerstrip has any number of possible applications, including automobile trim, appliances, hardware, and furniture. New embossed Amerstrip—like all types of Amerstrip—is made to meet the standards of highest quality. American Steel & Wire Division has a large, competent technical staff to help you select the embossed Amerstrip your product needs. Put extra beauty—and customer appeal—in your product with embossed Amerstrip Cold Rolled Strip Steel. For full information, call our nearest sales office. American Steel & Wire, 614 Superior Ave., N. W., Cleveland, Ohio.

USS and Amerstrip are registered trademarks

American Steel & Wire Division of USS United States Steel

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors • Tennessee Coal & Iron Division, Fairfield, Ala., Southern Distributors • United States Steel Export Company, Distributors Abroad

WORLDS
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52100
STEEL
Peterson
STEELS, INC.
Union, New Jersey • Detroit, Michigan • Melrose Park, Illinois

(*Concluded from Page 85*)

cember, 1957, because of "inability to compete in the public market," says A. E. Schobeck, president and general manager. Serious wage inequities have been adjusted in a four-year contract.

Expands Extrusion Plant

A $2.3 million expansion of Metals Processing Div., Curtiss-Wright Corp., Buffalo, has been authorized by the Defense Department. The funds will be used to expand the extrusion plant to make possible large scale production of important metal components of exacting requirements for space age missiles.

Plans Research Center

Diamond Alkali Co., Cleveland, will build a multimillion dollar research center in Concord Township, a few miles south of Painesville, Ohio. The first two units planned are the central research and development buildings, scheduled for occupancy in 1960.

Builds Refrigerator Plant

Construction of a refrigerator plant near Haddonfield, N. J., for Hussmann Refrigerator Co., St. Louis, has been resumed and is scheduled to be completed in the second quarter of next year. Construction was suspended in June, 1957, due to indications of the ensuing recession and the advisability of revising facilities to incorporate improved methods of manufacture.

Ulbrich Enlarges Plant

Ulbrich Stainless Steels, Wallingford, Conn., built an addition to its plant, providing an increase of over 50 per cent in its manufacturing facilities. Office facilities also have been more than doubled.

Plant Expansion Continues

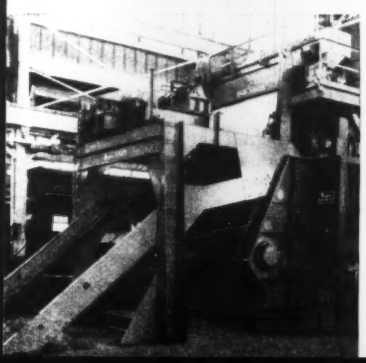
Pullman-Standard Car Mfg. Co., Chicago, continues to expand its Bessemer, Ala., facilities despite the suspension of its freight car production there Sept. 15. The second phase of a multimillion dollar expansion program, construction of a plant for the manufacture of freight car parts, is expected to be com-

(*Please turn to Page 92*)

BUILT BIG . . . TO CLEAN BIG

Giant Pangborn unit Rotoblasts loads up to 12,000 lbs. in minutes!

A side view of the 72 cu. ft. Pangborn Rotoblast Barrel. Pangborn Barrels available in 1½, 3, 6, 12, 18, 20, 32, 72 and 102 cubic foot sizes.



How do you build a giant blast cleaning barrel? If you're Pangborn, you use steel, inches thick. You put in the heaviest apron conveyor ever made. You incorporate the patented abrasive separator, abrasive-tight door, simplified Pangborn construction. You power it with two Rotoblast wheels that hurl *64 tons of abrasive an hour.*

Sure, it's tough to build . . . but it's worth it when you come up with a 72 cu. ft. Pangborn Rotoblast® Barrel! This unit cleans 6-ton loads *in five minutes* and gives the lowest operating and maintenance costs in the blast cleaning field! It's one of many Pangborn Rotoblast Machines. There's one for *your* problem.

The Pangborn Engineer in your area will be glad to take off his coat and go to work on your cleaning problem at no obligation. And, for more information, write for Bulletin 227 to Pangborn Corp., *1600 Pangborn Blvd., Hagerstown, Md. Manufacturers of Blast Cleaning & Dust Control Equipment.*

Clean it fast with Pangborn ROTOBLAST

How Earl Singleton cut the cost of

With 28 years experience in the abrasives industry, Bay State distributor Earl Singleton figures that one improvement in a grinding operation ought to lead the way to another. And, judging by the results he's produced, he's 100% right.

This is a good example of what happens when you tell a Bay State distributor your problem and give him a chance to experiment.

The problem: Grinding teeth on heavy traction gears for diesel locomotives at the Indianapolis plant of a large manufacturer of components for diesel locomotives.

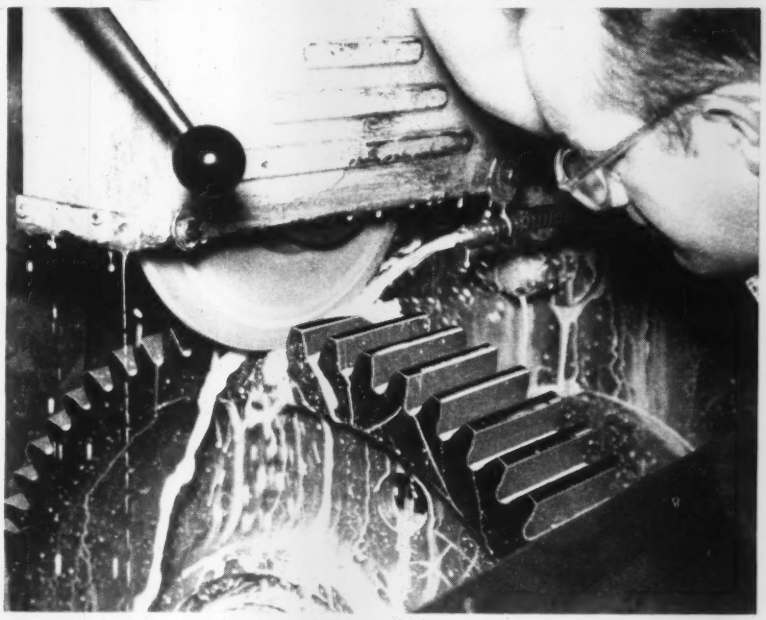
The man: Earl Singleton, Abrasive Engineer at Browning Tool & Supply Co., Indianapolis.

Working with the foreman of the department, Singleton came up with a 14" grinding wheel that cost 14% less than the premium-priced wheel it replaced. It held form better, too, and so didn't need to be dressed as often.

That was fine. But Singleton figured they might also get more pieces per wheel if they used a slightly larger wheel. After exhaustive tests to ensure complete safety, a 15" wheel was put to work and wheel life was more than doubled . . . from 16-17 pieces to 35-36. Down-time was reduced, too.

Even if you seem to have no particular grinding problems at the moment, it's worth while getting acquainted with the Bay State distributor in your area. Like Earl Singleton, he may find ways to save you money that haven't occurred to the people in your shop. *Better grinding at lower cost — that is his business.*

grinding heavy traction gears



Bay State specification cut wheel cost 14% . . . *and* wheel held form so well that wheel life was doubled under regular production conditions.

BAY STATE WHEELS of PROGRESS

BAY STATE ABRASIVES

Bay State Abrasive Products Co., Westboro, Massachusetts.
In Canada: Bay State Abrasive Products Co., (Canada) Ltd., Brantford, Ontario.
Branch Offices: Bristol, Conn., Chicago, Cleveland, Detroit, Pittsburgh. *Distributors:* All principal cities.

weldments as you want them...

For half a century, Kirk & Blum skilled craftsmen have been saving time and money for outstanding manufacturers. Whatever the weldment required, these experienced artisans know the most efficient technique to do the job accurately and quickly.

This know-how, plus modern Kirk & Blum equipment, assures high quality sheet steel and alloy fabrication.

Fabrication of guards, tanks, machine bases . . . all types of semi-finished and finished weldments . . . are available from Kirk & Blum to your exact needs.

Let K & B bring your drawings to life. Write for booklet, or send your prints for prompt quotation.

THE KIRK & BLUM MFG. CO.
3226 Forrer Street
Cincinnati 9, Ohio

KIRK & BLUM
SHEET & PLATE FABRICATION

(*Concluded from Page 88*)

pleted about Dec. 15. It will add 35,000 sq ft of manufacturing space. Capacity: 2000 tons of parts per month.

NEW PLANTS

United States Gauge Div., American Machine & Metals Inc., Sellersville, Pa., formally opened a plant addition which doubles the floor space available for gage and instrument production. Cost, including building and equipment: $4.5 million.

Wisconsin Coil Spring Inc. has started operations at 1914 S. 89th St., West Allis, Wis. Precision mechanical springs are produced. Officers are: President, R. W. Sloan; vice president, E. H. Lanke; and secretary-treasurer, R. A. Herriges.

Barden Corp. officially opened its Danbury, Conn., plant for manufacture of instrument precision ball bearings. The $2.5 million facility contains 125,000 sq ft of floor space.

Latrobe Steel Co., Latrobe, Pa., established a warehouse at McNicholas Storage Inc., Youngstown. It furnishes the aluminum extrusion industry steels used in producing extrusion dies and support tools. Frank E. Bell is sales representative in Youngstown.

NEW ADDRESSES

W. N. Best Combustion Equipment Co. Inc. moved its production facilities and offices to a new plant at 85 Industrial Ave., Little Ferry, N. J.

Bodine Electric Co. moved its general offices to 2500 W. Bradley Place, Chicago. The $1 million structure contains 47,428 sq ft of floor space.

Nippon Kokan K.K. (Japan Steel & Tube Corp.) moved its branch office to 39 Broadway, New York.

Automatic Switch Co. moved to its new plant at Florham Park, N. J. The plant more than doubles the

(*Please turn to Page 95*)

12 B&W IFB lined single stack annealing covers in use in the strip annealing department of Weirton Steel Company, a division of National Steel Corporation, at Weirton, West Virginia.

uses lightweight B&W Insulating Firebrick for single stack annealing covers.

These 12 covers, lined with B&W K-20 Insulating Firebrick, have been in service more than two years in the annealing of low and high carbon strip from Weirton's 54″ strip mill. Identical in construction, the covers are over 17 feet from base to skew and over 10 feet in diameter. The domes are of 9″ K-20 IFB construction.

The K-20 is one of B&W's *lightweight* Insulating Firebrick. In fact, B&W K-20 IFB are at least a third of a pound lighter than other 2000 F insulating firebrick. This means savings in the overall weight of portable covers. Additional savings in fuel consumption and cycle time are possible because lightweight B&W IFB store and conduct less heat. Heat is kept in the furnace, not in the lining.

This application points out advantages of light weight in insulating firebrick constructions. And B&W makes the *lightest* weight insulating firebrick. Consult your B&W Refractories Representative for information on how you can profit with lightweight B&W IFB.

Bulletin R-2-H available on request.

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THE BABCOCK & WILCOX CO.
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GENERAL OFFICES: 161 EAST 42nd ST., NEW YORK 17, N.Y.
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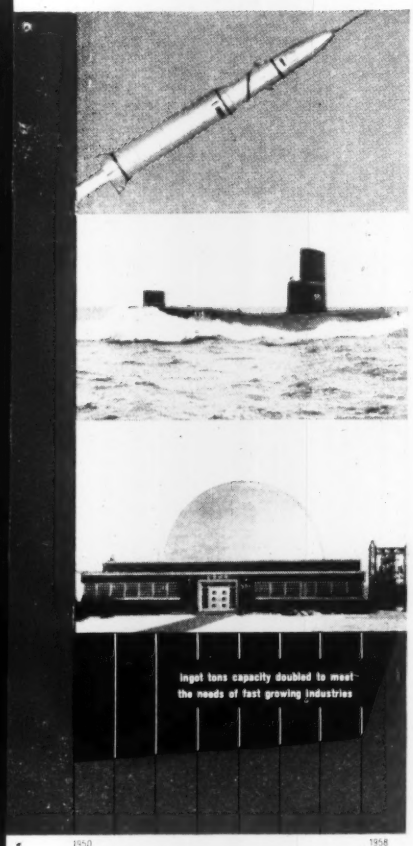
B&W Alimul Firebrick • B&W 80 Firebrick • B&W Junior Firebrick • B&W Insulating Firebrick • B&W Refractory Castables, Plastics and Mortars • B&W Silicon Carbide • B&W Ramming Mixes • B&W Kaowool

R-617

remember the Duryea ?



It was quite the aristocrat of its day . . . along with the Pope-Hartford, Knox, Locomobile and the Lozier—all gone and nearly forgotten ghosts of a magnificent era.

The motor maker's problem then was not *how to sell* but *how to make.* And to put fresh confidence in the infant industry's first steps, *Carpenter* contributed wondrous new chemistries of steel . . . the first basic automotive alloys.

Since that day, startling discoveries in the *Carpenter* laboratories read like a history of American steelmaking. New steel formulations, quality controls . . . even new steel terminology originated by *Carpenter,* are now standards in steel mills throughout the country.

With this leadership in pioneering and production of the world's finest steels—goes the responsibility of meeting the constantly growing demands of the atomic age—more stainless, more tool steels, more special-purpose alloys. For a company whose history was based on quality rather than quantity, this was quite a challenge.

To meet it, *Carpenter* has *doubled its ingot tonnage capacity within the past year, through the acquisition of steelmaking facilities in Bridgeport, Conn.* New furnaces, mills and finishers—all completely equipped with precise *Carpenter* quality controls—began operation.

Capacity—mass production of specialty steels for critical applications—is an established fact.

In the years ahead, *Carpenter* will continue to lead the way and grow apace of industry's ever-increasing demands for the world's finest specialty steels.

tool and die steels
stainless steels
electronic and magnetic alloys
special-purpose alloy steels
valve, heat-resisting and super alloy steels
tubing and pipe
fine wire specialties

Carpenter steel

The Carpenter Steel Company, Main Office and Mills, Reading, Pa.
Alloy Tube Division, Union, N. J.
Carpenter Steel of New England, Inc., Bridgeport, Conn.
Webb Wire Division, New Brunswick, N. J.

there's so much to choose from at...

HOTEL CLEVELAND

Cleveland Room
Dine in the splendid old world setting of a grand dining room. The menu is varied, the service unexcelled.

Bronze Room
One of the brightest of the city's supper clubs. Dancing nightly from 9:00 p.m.
Air conditioned, of course.

Rib Room
A true specialty restaurant For Fabulous Roast Beef, roasted, carved and served to your order.

MEN'S BAR
Strictly stag — is this all male haven for good drinks, good food and good talk. Plus sports events on TV.

TRANSIT BAR
For rapid service in the most unique bar in the country . . decorated with an outstanding collection of miniature trains.

the PATIO
Pause — in the relaxing, informal atmosphere of the gayly decorated Patio. It's a Cleveland habit to say — "Meet me at the Patio."

Coffee Shop
Service is brisk and decor cheerful in the modern, air-conditioned coffee shop. Enjoy a tasty sandwich or a moderately priced meal

HCA Hotel Cleveland
CLEVELAND, OHIO

(*Concluded from Page 92*)

firm's capacity to produce solenoid valves and electromagnetic control equipment.

ASSOCIATIONS

Elden L. Auker, vice president, Bay State Abrasive Products Co., Westboro, Mass., was elected chairman of the board, **Grinding Wheel Institute**, Cleveland.

Industrial Hygiene Foundation, Pittsburgh, appointed Dr. H. H. Schrenk managing director and Dr. W. P. Yant of Mine Safety Appliances Co., that city, chairman of the board of trustees.

Leslie S. Wilcoxson, Boiler Div., Babcock & Wilcox Co., New York, was elected vice chairman of the executive committee, **Welding Research Council, Engineering Foundation**, New York.

CONSOLIDATIONS

St. Louis Steel Casting Inc. acquired **National Tank & Boiler Co.**, custom steel fabricator. Both are in St. Louis. Carl A. Binder is president of St. Louis Steel Casting. Leonard Kosakowski will continue as president and general manager of National Tank.

Cleaver-Brooks Co., Milwaukee, acquired **Springfield Boiler Co.**, Springfield, Ill.

Federal Pacific Electric Co., Newark, N. J., purchased **Cemco Holdings Ltd.**, Vancouver, B. C., and its subsidiaries, **Cemco Electrical Mfg. Co. Ltd.** and **Cemco Switchgear Ltd.** This acquisition follows closely Federal Pacific's purchase of its former Canadian licensee, Federal Pacific Mfg. Co., Toronto, Ont. Cemco makes switches, switchgear, air circuit breakers, panelboards, switchboards, motor control centers, fusible equipment, bus supports, and related electrical equipment.

Cerro de Pasco Corp., New York, will acquire **Consolidated Coppermines Corp.**, also of New York, subject to approval of stockholders.

QUANTITY PRODUCTION OF GREY IRON CASTINGS

ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

ESTABLISHED 1866
THE WHELAND COMPANY
CHATTANOOGA 2, TENN.

"Samson" Shot (chilled iron)
"Angular" Grit
ANGULAR GRIT

AMERICA'S LEADING METAL ABRASIVES
The four most famous names in metal abrasives provide a size and type of shot or grit to meet every blast-cleaning need. Write for literature and recommendations.
PITTSBURGH CRUSHED STEEL CO.
Arsenal Sta., Pittsburgh 1, Pa.

MALLEABRASIVE
MALLEABLIZED SHOT and GRIT

SSP TRU-STEEL SHOT
TRU-STEEL HIGH CARBON STEEL SHOT

Specialties of the House

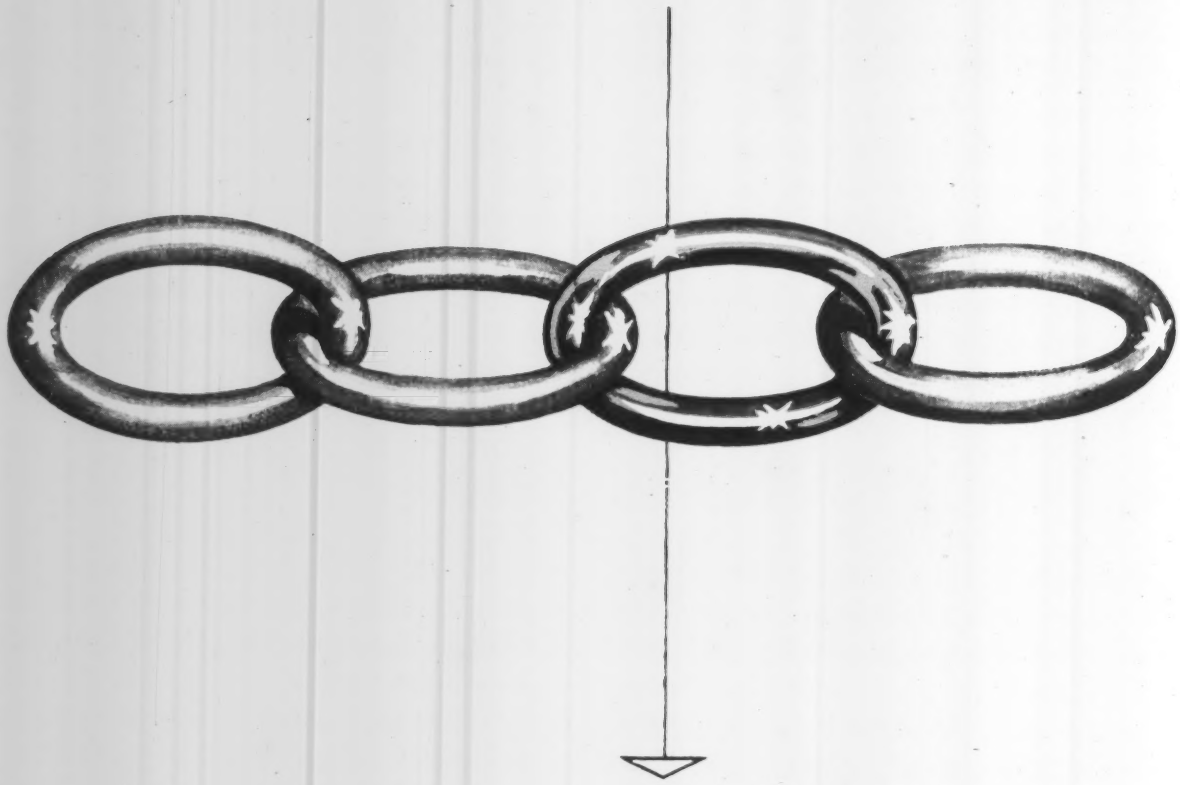
ROEBLING is a specialist in galvanizing, with practically unmatched facilities for producing galvanized wire in enormous quantities and in complete size ranges. Hot galvanized is available in sizes from .283″ to .035″. . . Roegal (drawn galvanized) from .187″ to .005″.

You *pay* for the best when you buy galvanized wire. Make sure you *get* it—specify Roebling! Write Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, N. J.

ROEBLING

Branch Offices in Principal Cities
Subsidiary of The Colorado Fuel and Iron Corporation

Roebling... Your Product is Better for it



SILICON – A VITAL LINK – indispensable in iron and steel, essential in aluminum casting alloys.

There are, today, many ferrosilicon alloys available, offering maximum efficiency and economy for industry's varied requirements. We have developed silicon alloys for specific applications, and extended the use of existing alloys. Our patented mold cast process provides silicon alloys of highest density, uniformity, and cleanliness.

A major producer of ferrosilicon for over thirty years, our four plants and strategically located warehouses assure you prompt delivery by water, rail, or truck.

Qualified technical personnel are ready to assist you in selecting the most efficient and economic silicon alloy for your needs.

Birmingham • Chicago • Detroit • Los Angeles • Philadelphia • Pittsburgh • San Francisco • Seattle • Denver • Minneapolis • Kansas City

Technical Outlook

ANOTHER HI-TEMP ALLOY— There's a new high (18 per cent) manganese chrome steel that's almost as strong at 1500° F as some superalloys containing 40 to 50 per cent cobalt. It's called AF-71. Allegheny Ludlum Steel Corp., Pittsburgh, developed the formula for the Air Force. (STEEL's Metal Selector, Oct. 20, predicted an early release.)

CORROSION PROTECTION—Zinc anodes do a good job of cutting corrosion from steel pilings on piers and docks. Evidence points to similar applications where steel members, tanks, and pipes are immersed in slightly corrosive solutions like hard water.

CHEAPER TITANIUM CASTINGS— Parts like valve bodies, centrifugal pumps, and agitators for extremely corrosive service are going to be cheaper to make in titanium because of Du Pont's rammed graphite mold composition. (Regular refractories react with titanium.) Oregon Metallurgical Corp., Albany, Oreg., says the method produces good castings with properties similar to those of forged or rolled materials.

IRON & STEEL STANDARD SAMPLES—The National Bureau of Standards now has sets of eight new standard samples of ingot iron and low alloy steels. Each is analyzed and certified for 17 elements to aid producers and customers in agreeing on product analyses. Samples come in rods and discs. Price: $4 to $6.

SPACE HYDRAULICS— Republic Aviation Corp., Farmingdale, N. Y., says it has a hydraulic system that operates smoothly in temperatures ranging from 20 to 1000° F. Unusual materials listed for the system include tungsten carbide and sapphires for balls, and Inconel X springs. The firm is conducting a $35 million space research program to find answers in these areas: Pilot environment, electronics and guidance systems, high temperature fuel systems, and basic metals for construction.

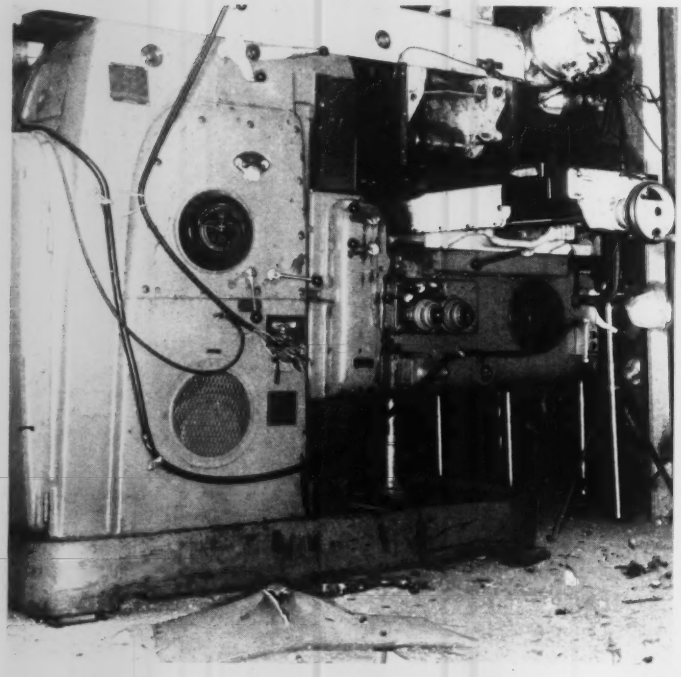
BAND AID— Need a seal for drum covers, pressure containers, sectional tanks? V-band couplings have built-in seals and toggle actions which simplify installation and removal. Some of the newer types are adequate substitutes for flanged and bolted connections.

HELP! FIRE!—Some of those little expendable cans, such as used for insect sprays, come packed with Freon and equipped with horns that make one devil of a racket when the cans get hot. They're great as cheap fire alarms. A blaze melts a plug, releasing the compressed gas. Other uses: Watchman's warning signal, emergency pressure source. You can get such devices from most refrigeration and plumbing supply houses.

ALUMINUM PLATE SPECIAL—Aircraft people say they'll welcome Alcoa's 7079-T651 plate. (The alloy has been available only in forgings and extrusions.) Significance: Longer, wider aircraft parts with more uniform thicknesses than forged pieces. Production requires pressing at Cleveland, then rolling, heat treatment, and stretching at Davenport, Iowa.

TITANIUM BEATS FRICTION— Seizing and galling (a perennial problem) gets the heave-ho when titanium parts are plated with nickel, says Battelle Memorial Institute, Columbus, Ohio. Some nonmetallics (like cyanide, nitride, and fluoride compositions) also do a good job.

Metalworking Outlook—Page 51 Market Outlook—Page 133



140,000 surface feet a minute—that's how fast this modified No. 6 Cincinnati milling machine is taking test cuts at North American Aviation Inc., Los Angeles. It drives a 14-in. VascoJet 1000 cutter body (carbide insert) at 38,000 rpm. Despite failures when cutters blow up (see damaged plate on the floor) tests verify absence of chips from high velocity cutting

Quartz lamps beneath this test plate help North American engineers evaluate hot machining. In one test, drilling a ¼-in. hole 5/16 in. deep in VascoJet 1000, the drill was dull and chipped after 38 holes made at room temperature. At 600 F, tool was still sharp after 345 holes

attacking the PRODUCIBILITY BARRIER

Wanted: A Revolution in Manufacturing

Your company can probably help the aircraft and missile industry make its transition to a space age technology. Here are some of the major areas of opportunity

HAVE YOU been shying away from market opportunities in aircraft and missiles because the potential looks too narrow?

Take another look.

Ten years from now almost every metalworking plant in the U. S. will be using at least one production method, machine, or material that doesn't exist today. Many will be developed to solve critical aircraft and missile problems, but their applications will fan out.

That's the beauty of pioneering. The potential of a new method, machine, or material is generally much broader than its originators can anticipate.

Convair's Dynapak (it extrudes, forges, forms, compacts, casts, shears, and blanks) started out as a shock tester for aircraft parts.

Chemical milling, another aircraft method, is already paying off in other branches of metalworking.

Pyroceram was developed as a nose cone material for missiles by Corning Glass Works, Corning, N. Y. Today, the company is introducing it to the civilian market in the form of skillets and casseroles.

Another factor favors the metalworking company that's willing to take a calculated risk in this new market. The aircraft and missile industry doesn't have the time to wait on evolution. Its conversion to a space age technology calls for

a revolution in methods, machines, and materials.

• **Needs Spelled Out**—"We have designs that cannot be produced and materials that can't be utilized effectively," says Col. Preston L. Hill, chief, Manufacturing Methods Branch, Industrial Resources Division, Air Materiel Command. "We must develop manufacturing processes and equipment to turn these new materials and advanced designs into production parts."

Here are a few of the needs a dozen major aircraft and missile makers cited to STEEL, along with some ways the industry is trying to solve its problems.

Materials

Commercial tolerances on sheet metal are not tight enough. With the move to high temperature materials, the problem is critical. New high temperature, high strength metals are at least four times as expensive and difficult to machine as aluminum, the aircraft bread-and-butter metal, says production men.

Tolerances that could be excused in aluminum will be unforgivable in steel. If wing skins were delivered on the high side of commercial tolerances, a surface of 4800 sq ft would be nearly a ton overweight at a cost of $10 to $100 a pound.

The much touted North American X-15, designed to hurl man into space, uses Inconel X for skins. The B-70 "chemical bomber," the most advanced aircraft you can discuss, is reported to consist of AM 355 and PH 15-7 Mo steels, and titanium—all rough to fabricate.

Another basic need: More fabricating knowhow on new materials, like beryllium and tungsten.

Machining

The higher the strength and temperature resistance of a metal, the harder it fights a cutting tool.

At Marquardt Aircraft Co., Van Nuys, Calif., one spokesman laments: "We used to speed through metal at 1200 to 1500 surface feet a minute. Now we're down to 150 sfpm regularly and as low as 30 sfpm on some of the metals."

• **Whoosh!**—High velocity machining is one of the white hopes. At Lockheed Aircraft Corp., Burbank, Calif., engineers rigged a 30-06 rifle to fire a slug past a cutting tool. They're learning what happens at, say, 160,000 sfpm. (STEEL, Apr. 14, p. 138.) Now Robert L. Vaughn (he runs the tests) tells STEEL he is setting up a modified 20 mm gun to fire at even higher velocities.

Both Lockheed and North American tests (see photo, Page 100) substantiate the claim that at supervelocities tough metals cut easily with little tool wear and that the metal is apparently vaporized—thus no chips.

Will high speed machining work? No one is willing to bet a penny it will. The experts' opinion: "Until it's proved, or disproved, or some other solution comes along, we'll continue our search."

• **Use Heat?** — Metals machine more easily hot than they do at room temperature. M. Eugene Merchant, director of physical research, Cincinnati Milling Machine Co., Cincinnati, says: "In milling high strength, thermal resistant alloys, we have found hot machining permits considerably increased metal removal rates in the laboratory, but many practical problems remain to be overcome."

• **And Cold** — One aircraftmaker machines 4130 steel parts at subzero temperatures. The reason: Get rid of work hardening that accompanies room-temperature metal cutting. Also, some metals are more ductile at low temperatures.

• **Maturity**—Recent metal removal developments like chemical milling, ultrasonic machining, and electromachining, are established. "Now," say the experts, "give us refinements."

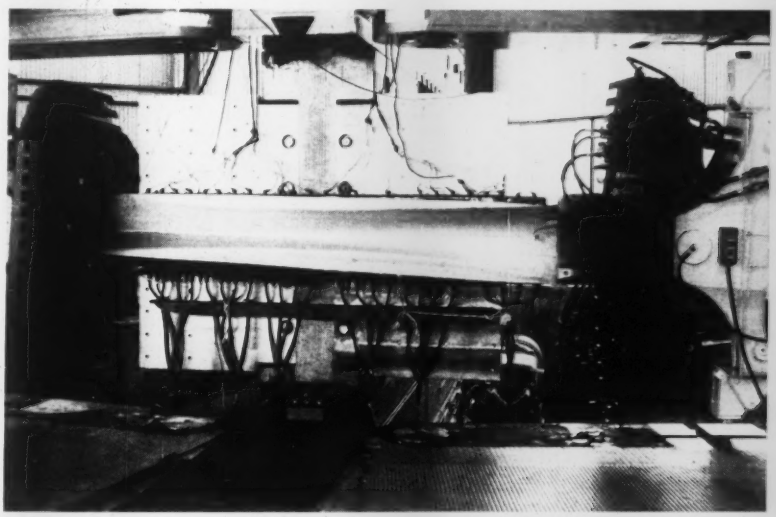
Production men using chemical milling want to get away from time-consuming template making and masking, both hand operations. North American's M. C. Sanz, chemical milling's inventor, told STEEL that the silk screen process and photographic reproduction of templates show promise.

Aircraftmakers are sizing up the new Elox machine used for diesinking. They figure they can make it form waffle grids for sandwich structures. (Start with plates; sink the pockets; and wind up with an integrally stiffened, strong skin.)

Electrolytic grinding, like the Anocut method, is established in honeycomb core machining. Solar Aircraft Co., San Diego, Calif., has developed its own machine, spindle, and wheel to do the job. Solar spokesmen say the process can cut to an almost unlimited depth.

A major maker of abrasive belts is said to be working on a woven-metal backing for belts. The aim: Electrolytic belt grinding.

Ultrasonic machining will become even more important as aircraft continues its move to hard metals and nonmetallics. One limitation: It may be tailored only for



Titanium sections with compound contours are hot stretch formed on this Hufford press at Rohr Aircraft Corp.'s Chula Vista, Calif., plant. The work is stretched over a form block that's heated by Calrod and cartridge-type electrical heating units

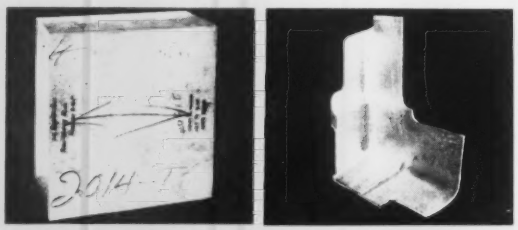
Hogging Cuts: Aircraft 'Outcasts'

NEARLY every aircraft and missile maker tells STEEL that rough machining must be replaced by precision forming. The industry wants forgings, extrusions, and castings which are "born to shape."

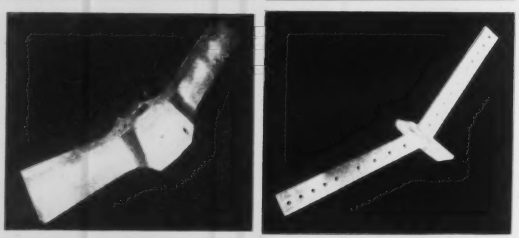
Here are several examples that show why. They illustrate the heavy penalty that's being paid in the form of waste chips; they also substantiate the claim of one production supervisor: "Because machining costs us so much, we can afford to pay dearly for any process that will eliminate much of it."

These parts are made of aluminum. When steel is substituted, the cost of machining becomes even more unbearable.

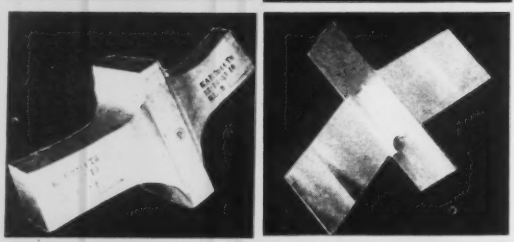
Billet . . . 60 lb
Part . . . 1.4 lb
Loss . . 58.6 lb



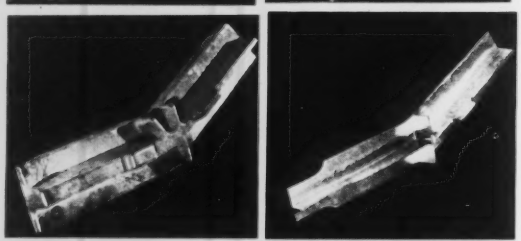
Billet . . . 20 lb
Part . . . 0.6 lb
Loss . . 19.4 lb



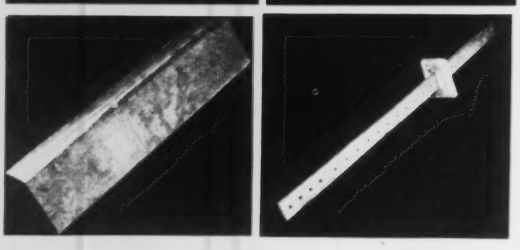
Billet . . . 24 lb
Part . . . 0.9 lb
Loss . . 23.1 lb



Billet . . . 34 lb
Part . . . . 5 lb
Loss . . . 29 lb



Billet . . . 54 lb
Part . . . 0.6 lb
Loss . . 53.4 lb



relatively small parts.

Forming

Convair's Thomas E. Piper, executive staff assistant, asserts: "The biggest concept the aircraft industry has to work with is one of using parts that are born to shape."

Closer tolerances, better definition, and improved surface finish are musts on steel forgings. "There's still too much machining even on precision forgings."

Also needed: Shallow and zero-draft forgings and thinner sections. More forging knowhow is needed to turn out quality parts in the new high alloys. Forgings with 300,000 psi tensile strengths are a reality; higher tensile requirements are in the works.

• **What Cost?**—They tell this story at Lockheed: Tolerances were made so tight on a $35 forging that its cost rose to $65. Lockheed engineers then told the vender: If he could improve the part and eliminate machining, they could afford to pay him $200 a forging.

• **Extrusions**—What aircraft makers say about forgings holds for extrusions: The need is for tougher metal extrusions, better tolerances and finish, thinner sections, and some larger extrusions.

Convair engineers feel their Dynapak (STEEL, Nov. 3, p. 41) will answer some problems for both forgings and extrusions. It has produced parts with superior surface finish, close tolerances, and good definition. Extruded webs 0.005 in. thin have been formed.

• **Boom!** — Explosive forming (STEEL, Aug. 25, p. 82) is spectacular at forging, extruding, and sheet forming. Apparently there's no springback; metal can be moved farther than theory allows; and feasible shapes are out of the reach of conventional methods.

• **Sheet Forming**—The new materials pose a dilemma. Many can't be drawn, stretched, or otherwise formed at more than about one-half hard without severe springback or tearing. They are formed half hard (or less), then heat treated. But in heat treatment, distortion and growth can slaughter formed precision.

One answer: Hot forming, or at least hot sizing. A Convair engi-

neer proposes forming at stress relief temperatures. "We'd like to eliminate one step . . . form at the stress relief temperatures, then hold the parts in the forming dies while they cool. It would put stress relieving and forming in one operation."

Engineers at Ryan Aeronautical Co., San Diego, Calif., have probably done more on hot forming of titanium than any other single company. They have six machines in production.

• **Cold Forming**—Subzero forming frequently pays off with metals like 321 stainless and the new titanium alloy, B 120VCA. The titanium permits about 18 per cent elongation at room temperature; at 110 F, it's 22 per cent.

At Convair (Astronautics), engineers have tried subzero drop hammer forging on 321 stainless with good results.

Spin forming and forging is a good bet to lick the problems of many one-piece, concentric shapes. The latest machine in the field was built by Hufford Machine Works, El Segundo, Calif., for Marquardt Aircraft Co., Van Nuys, Calif. It can spin a part 60 in. in diameter and 60 in. long.

Casting

Castings, teamed with formed parts, are counted on to deal the one-two punch to rough machining. One spokesman says: "We want to use castings as-cast, with little or no machining required."

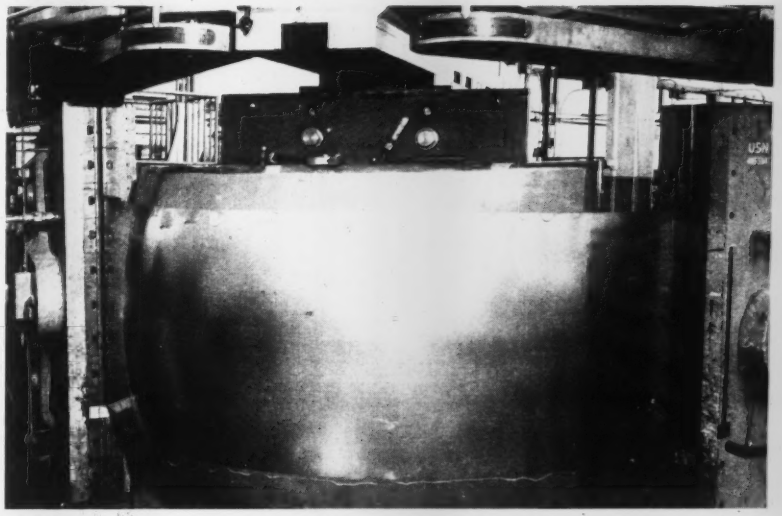
The call is for closer tolerances on all dimensions. Lighter and thinner sections are musts.

• **Quality** — High strength steel castings must have consistent, superior quality. Aircraftmakers are asking for 5 per cent elongation. Strength must be boosted; cast parts with tensile strengths to 300,000 psi are sought.

One of the country's leading foundries is at work on the strength problem. Production engineers have produced pilot runs of investment cast high alloy parts with 3 per cent elongation and tensile strengths to 300,000 psi.

• **Two to Watch**—Ultrasonic vibration of the mold during castings to boost density must be given a run for its money.

Aircraft quality demands high purity in castings. Industry production men are looking to further refinement and development in vacuum casting.



Type 301 stainless is stretch formed at room temperature by Convair, a division of General Dynamics Corp., San Diego, Calif. If the stainless is greater than half hard, it is chilled to −100° F with dry ice and alcohol. The temperature is held during forming by spraying the metal with carbon dioxide

Welding

The universal need: Closer control of all phases of welding cycles. Though welding equipment makers have done a "fantastic" job of keeping up with quality demands, says one spokesman, "what's good enough today, will be inadequate tomorrow."

• **Problem Area**—Many companies are welding sheets as thin as 0.001 in. Some thin sheets must be welded to thicker ones. A spokesman for Douglas Aircraft Co. Inc., Santa Monica, Calif., points out: If the metal heats up, the temper is lost.

Two comers: Ultrasonic and cold welding. Both offer the advantages of no heat. Both can be used to weld dissimilar metals.

• **Electrodes**—Both wire and rods must be as good as the parent metal. It could mean a weld with a 320,000 psi tensile strength.

Most new metals are vacuum melted. "We must have the same quality in the weld wire and bead."

At Rohr Aircraft Corp., Chula Vista, Calif., thin sheets are butt-welded by turning closely controlled, 90 degree lips on both sheets. The lips are butted, the parts clamped, and a U-shaped channel used as a backup bar to deliver helium to the weld. A Heliarc welder on top burns the lips down, melting them into a weld bead. The advantage: "We have no filler material at all; the weld will heat treat to parent metal properties."

Heat Treating

In heat treating, like welding, the aircraft requests are for refinements. Vertical furnaces alleviate the distortion problem. But, say the aircraft makers, furnaces will have to be larger.

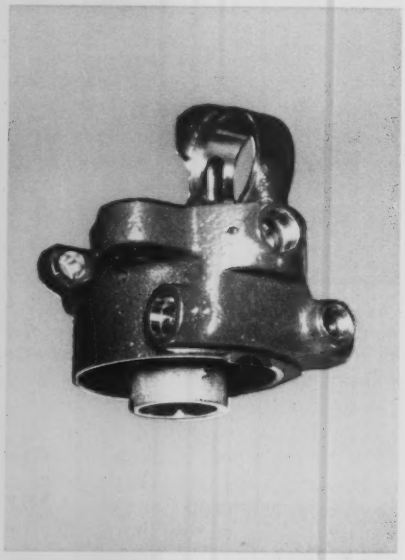
Controls need to be improved, provide even heat over the entire furnace area. There's also need for more basic shop information on heat treat fixturing. One engineer speculates that high temperature ceramics may be needed.

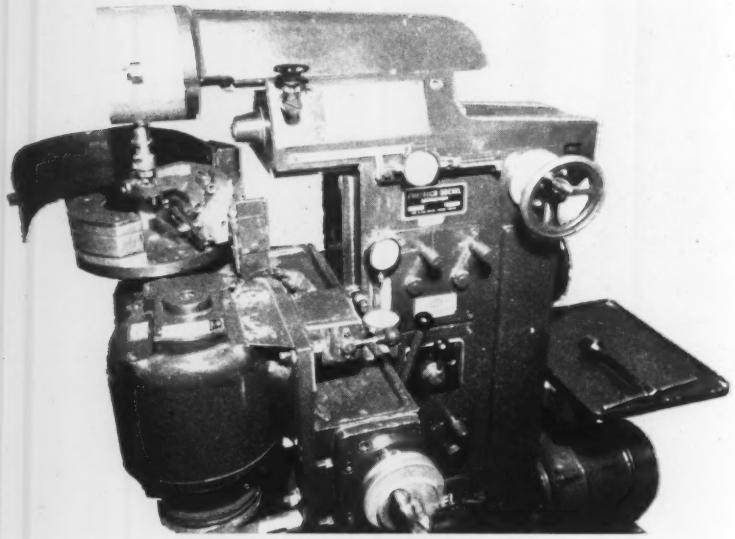
Opportunities Unlimited

This article merely outlines some of the development work that must be done for the aircraft and missile makers—and for industry as a whole.

At nearly every stage in production, basic information and equipment are lacking. Some solutions are on the horizon. But the field is wide open. It offers unlimited opportunities for progressive metalworkers.

THE JOB: Machine a bronze casting





This specially converted milling machine . . .

Special Machine

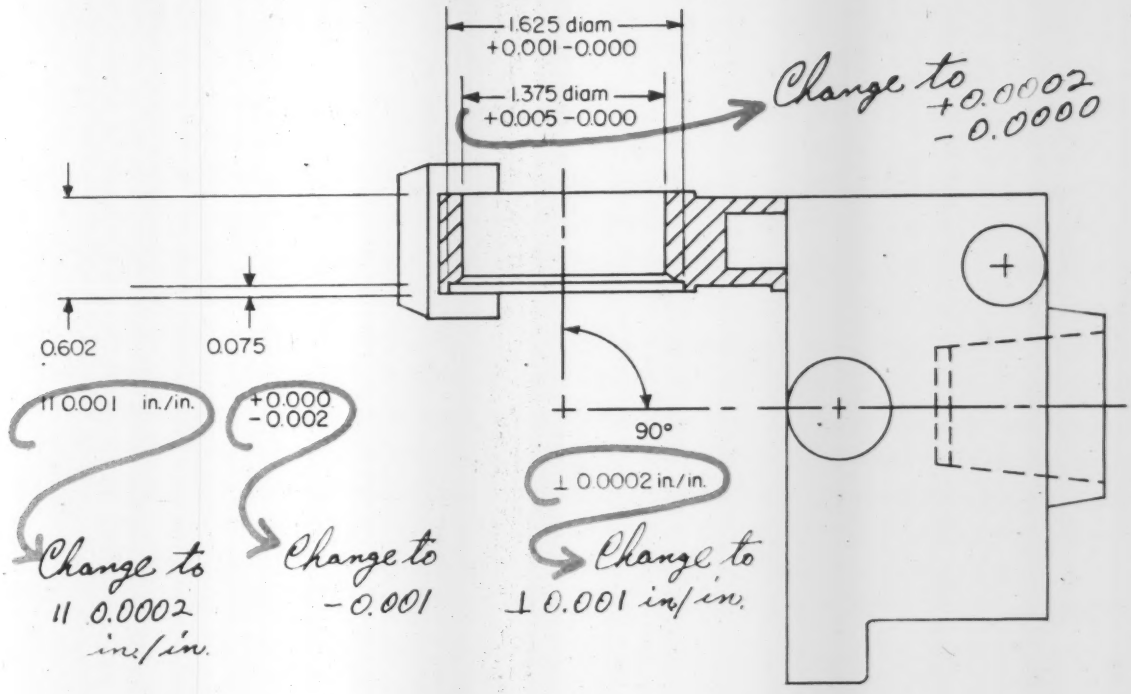
Jacks Up Quantity and Quality

Engineers build their own machine to get production up, while holding the cost line. This article is one of the top entries in STEEL's Cost Crisis Awards Competition. Another will appear in next week's issue

COST CUTTING on a production line can be a complex, tedious chore.

Take a case at Ansco Div., General Aniline & Film Corp., Binghamton, N. Y. Production management faced the triple-sided problem of boosting production, trimming costs, and holding or bettering tolerances on a bronze instrument casting.

• Old Way — The casting was rough and finish machined on a turret lathe—cutting the hole,



helped engineers trim part tolerances

THE PAYOFF

With the new machining setup, production management at Ansco:

1. Trimmed 60 per cent off machining time.
2. Boosted part uniformity.
3. Lifted the quality level by tightening tolerances.

counterbore, and rear face. Warren C. Hauck, plant manager, explains that his crew had trouble maintaining production since they had no adequate way to allow for small discrepancies in the parts.

Result: A real problem in maintaining extremely close tolerances in production.

• **Three Tries**—Production experts tried rough boring the hole and finishing both the counterbore and back face on the turret lathe. The bore was finished on a jig bore. Result: Good tolerances on the parts, but maintaining the production schedule was too costly.

Next, the whole job was moved to a double-end precision boring machine for both roughing and finishing. "But," says Mr. Hauck, "we couldn't hold the required tolerances."

Finally, production men decided to design and build a special purpose boring machine.

• **New Way**—Starting with a milling machine they had on hand, the engineers revamped the setup with a special lathe headstock that cost about $400. Then they added a new toolholder, a combination carbide tip boring and forming tool, face plate, dynamically balanced fixture, mounting plate, motor and dial indicators.

The cost of the equipment was roughly $2000.

The payoff was almost immediate. Production rates jumped and tolerances were tightened, boosting the quality of the part.

The dispatcher's switchboard is the nerve center for machine operator requests. On arrival at the operator's station, the cart is easily removed

Dispatched Conveyor Cuts Idle Time

A single overhead setup delivers parts, tools, fixtures, and instructions to machine operators. In final stage, it removes the completed work and chips

MATERIAL flow is keyed to machine operator needs in the Large Steam Turbine-Generator Dept., General Electric Co., Schenectady, N. Y.

How: An overhead tow conveyor system is regulated by the dispatcher. The system makes it unnecessary for operators to wait for material and instructions. Work areas are cleaner, and chips and other waste are quickly removed.

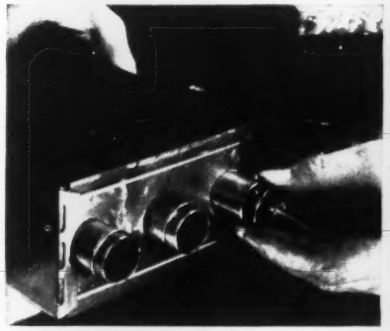
The system, designed and constructed by Mechanical Handling Systems Inc., Detroit, consists of an endless chain about one-third of a mile long. Its heart is the marshaling area which is linked to the machining sections through a dispatcher's switchboard and conveniently located telephones.

• **How It Works**—When a machine operator requires work within a predetermined time, he telephones the dispatcher. New work is sent from the marshaling area, and the operator identifies his cart by a number. Signal lights at the operator's assigned telephone and dispatcher's console provide an additional means of signaling.

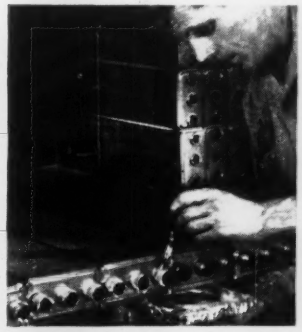
• **Carts Are Specialized**—One style of cart has shelves for holding turbine buckets while another has a container for chips. All are equipped with telescoping masts for rapid removal from the conveyor chain.

Completed work is attached to the conveyor, and the cart is moved to the next assigned operator or back to the marshaling area—as indicated by a work schedule.

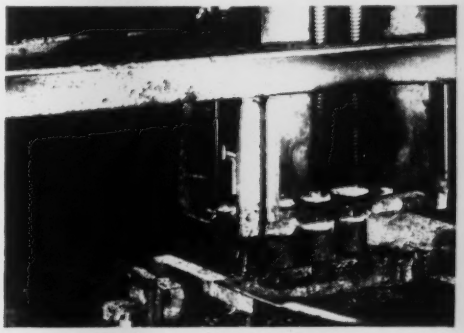
Special chips are segregated from regular ones; the color of the cart and an appropriate inscription denote the cart to be used. Chips are dumped by a trolley hoist which carries the cart to outside bins.



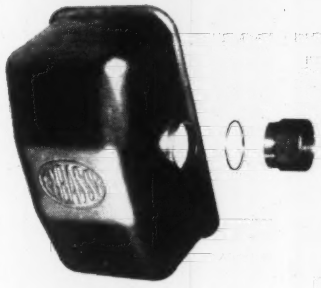
1 EASY-FLO preform ring is slid over header tubes.



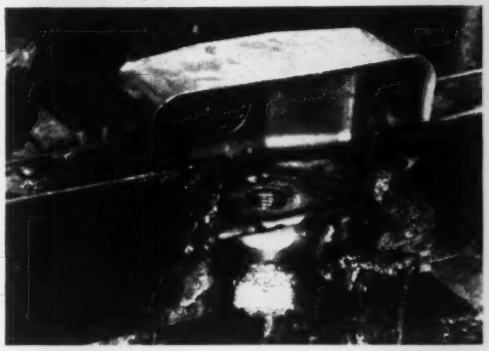
2 Operator fluxes bank of assemblies prior to heating.



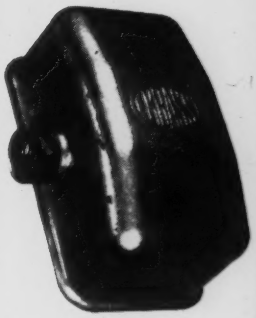
3 Assembly is heated by gas-air burners; heating time: 50 seconds. Note capillary action of alloy; thorough penetration makes strong, leakproof joint.



4 Components of header box; ring is preplaced.



5 Header box under heat; time: 46 seconds.



6 Brazed unit. Note neat, clean fillet around base of tube fitting.

Embassy Steel Products **Cut Unit Labor Cost 50 Per Cent** with **Handy & Harman Silver Brazing**

START WITH BULLETIN 20

It tells you why and how high speed, strength and economy are inherent in silver alloy brazing. Gives information on joint design and brazing methods. A copy is yours for the asking.

Before Handy & Harman Silver Alloy Brazing came into Embassy Steel Products' production picture, these convector radiators were welded. Now, they are brazed with EASY-FLO 35 *using gas-air heat, and unit labor cost has been cut by 50 per cent. This includes cleaning, fluxing and assembling. Not bad, eh?*

Components involved in this big saving are cold-rolled steel header plates that are brazed to fin tubes and cold-rolled steel header boxes that are brazed to steel fittings. Both of these convector assemblies are used in residential heating units.

Preformed EASY-FLO .047 wire (.015 ID) is used for brazing the header plate and fins. Photographs describe the joining steps. Each assembly goes through a 50-second heating cycle.

The header box is made in three sizes—depending on the size of the coil assembly it fits. Average heating time for any size is 46 seconds. Two sizes of EASY-FLO are used: .047 and .062 wire. Switching from one size to another involves no change in assembly or heating setup. Add this to brazing's long list of production benefits and *subtract* it from production costs.

If all we had to talk about in this case was the reduction in production time because of brazing, we'd still have a strong story to tell. You'll notice that we've said nothing about joint strength, alloy cost, corrosion resistance, ductility and so on. We can, and if you'd like to know how these benefits can apply to what you're joining right now, all you have to do is ask us. We'll be happy to tell you.

Your No. 1 SOURCE OF SUPPLY AND AUTHORITY ON BRAZING ALLOYS

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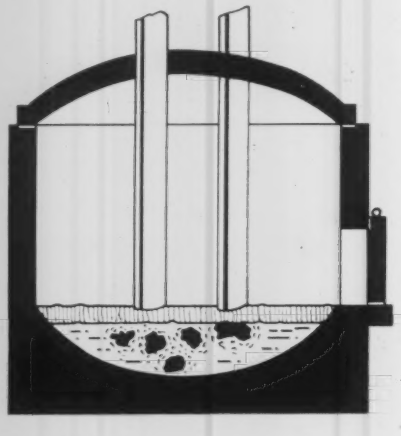
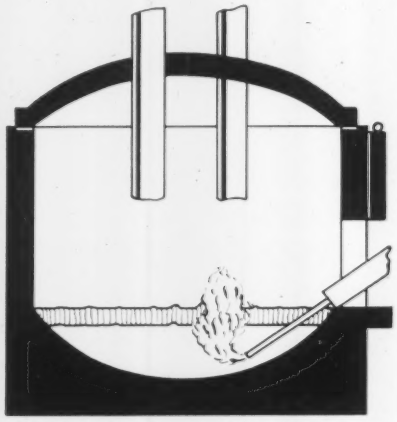
Ore vs. Oxygen Refining in 3-Ton Electric Furnace

ORE



REACTION TIME: 30 MINUTES
Metal is cooled by ore and heat absorbing reaction

OXYGEN



REACTION TIME: 2 MINUTES
Metal temperature rises because of exothermic reaction

Oxygen in Electric Furnace Benefits Producer and User

The metal is cleaner and has better fluidity. Producers save on materials, power, and refining time. Oxygen gives operator positive control in decarburizing

STEEL mills and foundries are gaining operating economies and passing on important metallurgical benefits by using oxygen to refine electric furnace heats.

The method gives the furnace operator positive control over removal of carbon and other unwanted elements. Oxidizing is started and stopped by a quick-acting valve.

Several other advantages are pointed out by National Cylinder Gas Div., Chemetron Corp., Chicago.

• **Metal Is Cleaner**—Injection of oxygen removes hydrogen and other nonmetallic impurities from the bath.

Fluidity of the metal, a major factor in castings, is increased. It is lessened by the surface tension of the molten metal. Gas and nonmetallic inclusions increase surface tension.

The use of oxygen promotes a vigorous carbon boil, which is necessary for good cleaning action and quick refining.

• **What It Does**—Oxygen is injected directly into the molten metal with a lance. It reacts with iron to form iron oxide. The iron oxide is uniformly dispersed throughout the bath where it reacts almost immediately with the carbon to form carbon monoxide. Carbon monoxide gas is evolved from the metal, removing the carbon from the bath.

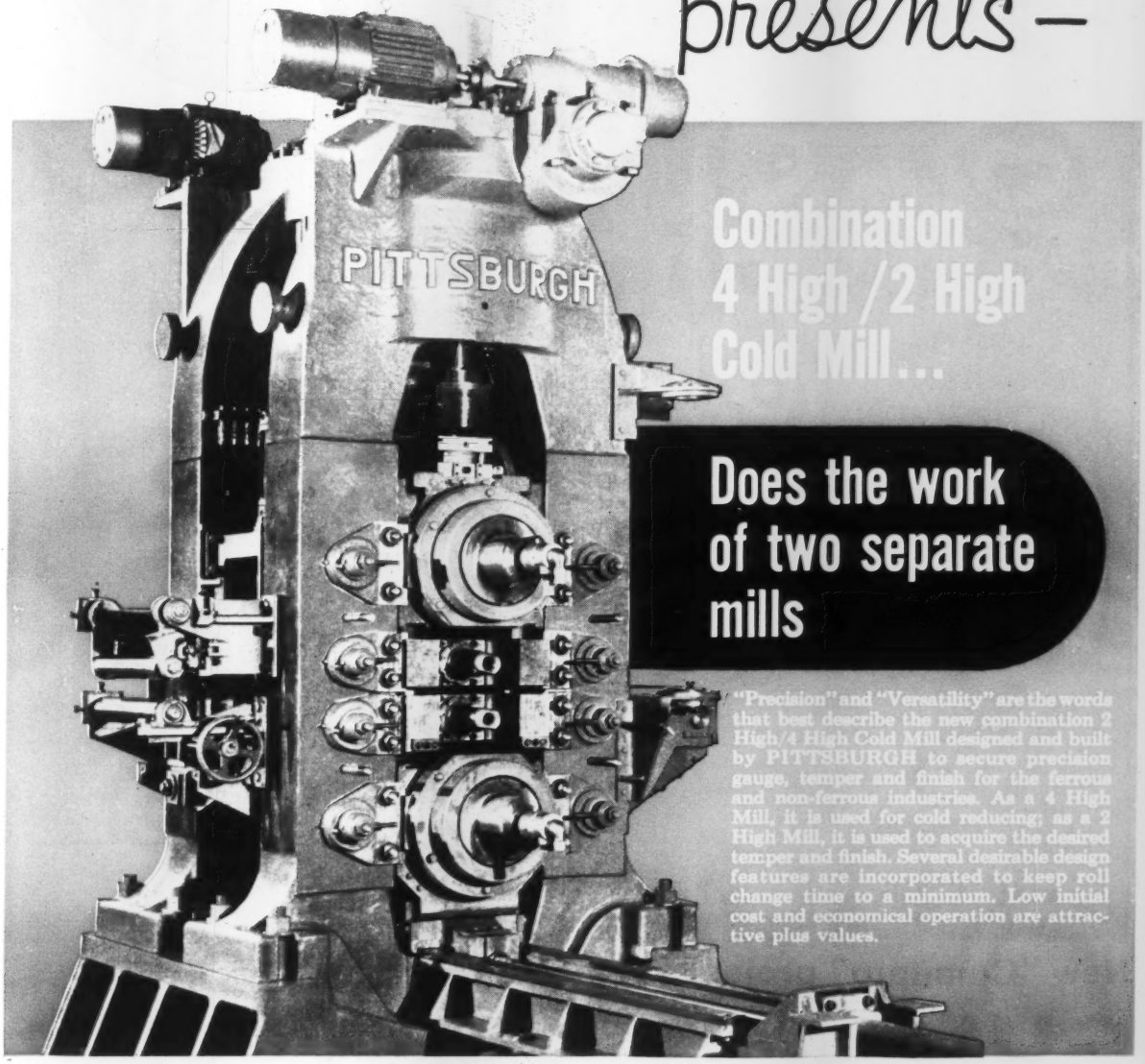
Injection of oxygen must take place at about 2830° F to produce a carbon boil. The injection also increases the temperature of the bath. The period of the oxygen injection depends on the amount of carbon to be removed.

• **Economy for Producer** — Many electric furnace steelmakers use oxygen in place of iron ore for refining. Experience indicates that the tech-

(*Please turn to Page* 112)

PITTSBURGH

presents—



Combination 4 High /2 High Cold Mill...

Does the work of two separate mills

"Precision" and "Versatility" are the words that best describe the new combination 2 High/4 High Cold Mill designed and built by PITTSBURGH to secure precision gauge, temper and finish for the ferrous and non-ferrous industries. As a 4 High Mill, it is used for cold reducing; as a 2 High Mill, it is used to acquire the desired temper and finish. Several desirable design features are incorporated to keep roll change time to a minimum. Low initial cost and economical operation are attractive plus values.

Heavy Machining Facilities

Our plant is equipped with a superior complement of well diversified machine tools that are available on a continuing basis for economical machining of heavy castings or the manufacture of auxiliary rolling mill equipment, such as heavy mill tables, furnace pushers, slab depilers, downcoilers, ingot buggies, slab transfers, etc.

PITTSBURGH

ENGINEERING & MACHINE

Division of Pittsburgh Steel Foundry Corporation

P.O. BOX 986, PITTSBURGH 30, PENNSYLVANIA

PLANT AT GLASSPORT, PENNSYLVANIA

New "Comapro" project cuts machining time up to 30%...

GULF MAKES THINGS

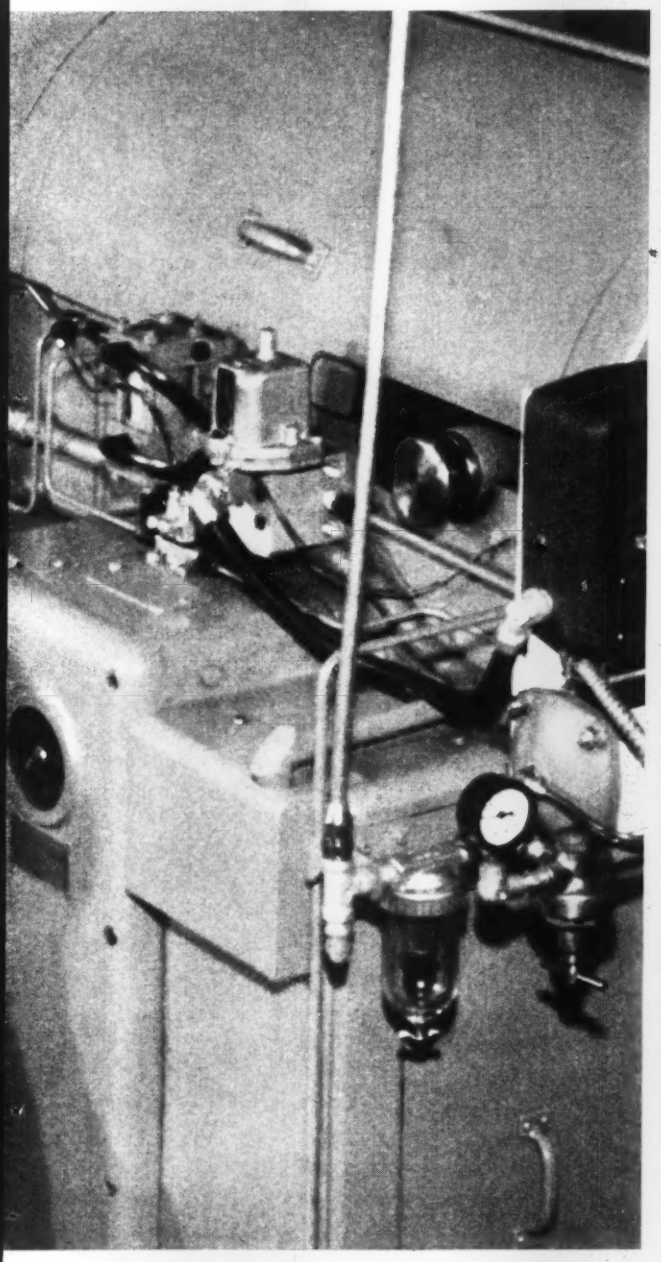
Only five months under way, the Cooperative Machining Project known as "Comapro" has already developed unusual time-saving and cost-cutting machining practices, using Gulfcut Cutting Oils.

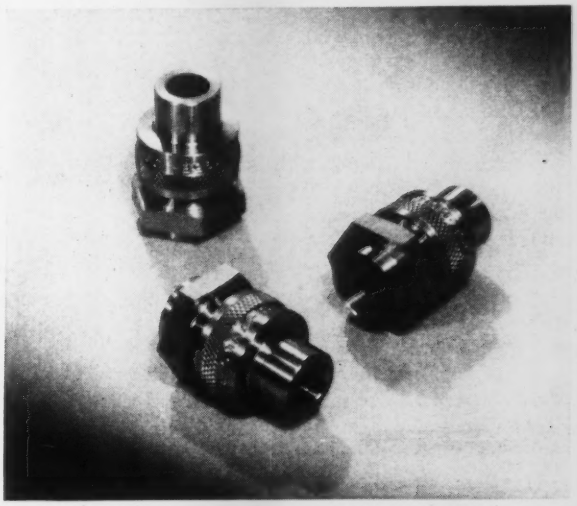
A case in point is the machining of a simulated spark plug shell at the COMAPRO Department of one of the participating manufacturers—Cone Automatic Machine Company, Windsor, Vermont.

Using Gulfcut Cutting Oil in a Conomatic bar machine, they're running this spark plug part in 4.4 seconds, compared to an industry average of 6 seconds. A 30% saving in machining time!

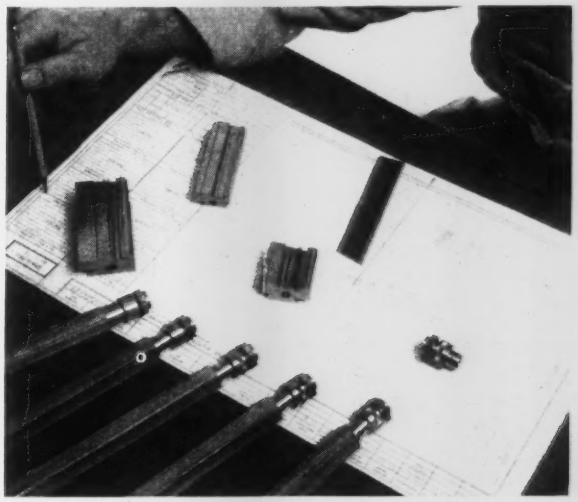
This is right in line with the over-all objective of "Comapro"—to develop more efficient ways to cut the cost-per-part figures in a wide variety of machining jobs, particularly in mass production. Findings will be made available to the entire metalworking industry.

As a co-sponsor of "Comapro," Gulf supplies all the





Lower cost per piece—on a great variety of machined parts—is the main goal of the "Comapro" cooperative cost-research program. For complete information on the latest findings of the project, write to COMAPRO, c/o Cone Automatic Machine Company, Windsor, Vermont.



◀ This Conomatic automatic bar machine is a pilot unit in the "Comapro" research project. Gulfcut Heavy Duty Soluble Oil helps it operate at maximum output, to determine best machining practice at lowest cost per part.

and proves again

RUN BETTER!

cutting oils for the project, from the complete Gulfcut line—plus Gulf greases and machine lubricants. Under closely controlled research conditions, the proof is piling up that Gulf makes things run better!

Let us help you put "Comapro" findings to work in *your* production—and show you how Gulf makes things run better in your plant, operation-wise and cost-wise. For complete information, call a Gulf Sales Engineer at the nearest Gulf office.

GULF OIL CORPORATION
Dept. DM, Gulf Building
Pittsburgh 30, Pennsylvania

GULF

nique saves an average of 50 lb of iron ore per ton of steel.

Oxygen costs less than the ore it replaces. It is unnecessary to use large amounts of oxygen in the electric furnace. Many foundries have found that lower cost scrap can often be used in the charge.

• **Refining Time Cut**—The faster reaction time and increased temperature obtained with oxygen materially reduce charge-to-tap time. In a 3-ton furnace, reaction time with iron ore averages about 30 minutes. It averages about 2 minutes in the same furnace when oxygen is used.

• **Use Less Power**—Substantial savings in power are realized because the reaction between gaseous oxygen, iron, and carbon is exothermic (generates heat). Iron ore causes a heat absorbing action.

When oxygen is used, electric power can be cut off during the decarburizing period. Heat from the exothermic reaction increases bath temperature even with the power off. Experience indicates that about 50 kw-hr is saved per ton of steel.

• **Saves Electrodes**—With the power off during oxygen injection, electrodes can be raised well above the bath. Because of that and reduced heat time, electrode consumption is decreased.

When iron ore is used for oxidation, the electrodes must be in contact with metal during the carbon boil. That condition and the longer heat time result in higher electrode consumption.

• **Refractories Hold Up Longer** — Higher temperatures do not always increase refractory wear. If injection is properly controlled, furnace bottoms generally show well rounded shapes which are characterized by solid hard surfaces and little or no honeycombing or metal pickup. Banks are usually in better condition than they are with ore heats.

• **Saving in Alloys**—The sequence of removal of silicon, manganese, and carbon from the steel bath is a function of temperature. Oxygen is generally introduced at a temperature above the carbon reaction temperature; so the silicon and manganese residuals are sometimes higher, a condition which often results in increased alloy savings.

Production Hits a Barrier

Needed: An all-out industry attack on metalworking jobs that can't be done today. Now is the time to launch your company into space age technology

IF anyone had claimed five years ago that a good way to forge tough parts is to blast them with dynamite, most of us would have suggested psychiatry.

Today, the process is known as explosive forming, and it's in production.

Three years ago, many of us would have laughed off the suggestion that one way to extrude tough metals into webs 0.005 in. thin is to fire the ram at about Mach 1.

Today, the process works on Convair's Dynapak, and it's in production.

• **The Pace**—A revolution in manufacturing is underway. (See Page 100.) It's getting its biggest momentum in the aircraft industry, but it won't stay there for long.

It is only a matter of time until supermaterials designed for the space age will be called on to upgrade other industrial and commercial products.

• **Your Place**—Most of the burden for solving the producibility snarl will fall on metalworking. And if you "let George do it," you may be missing a bet for your share in the new technology.

Take the science of machining. Is there merit to machining supermetals at, say, 160,000 sfpm? Will hot machining help? Will the new plasma jet (with temperatures to 30,000° F) do a machining job?

Impossible? Remember explosive forming.

• **Profit**—One major machine tool builder has been studying hot machining for two years. There's still a lot of work to do on the project, but when, and if, hot machining works on problem jobs, this company will cash in on it.

• **The Bandwagon**—Want to know what's needed? Go to the aircraft industry's production men. They will be delighted to tell you what they need. The problems cover a broad area of metalworking; more than likely you can handle at least one of them.

• **Help**—If you come up with a good idea, the government may help you finance its development.

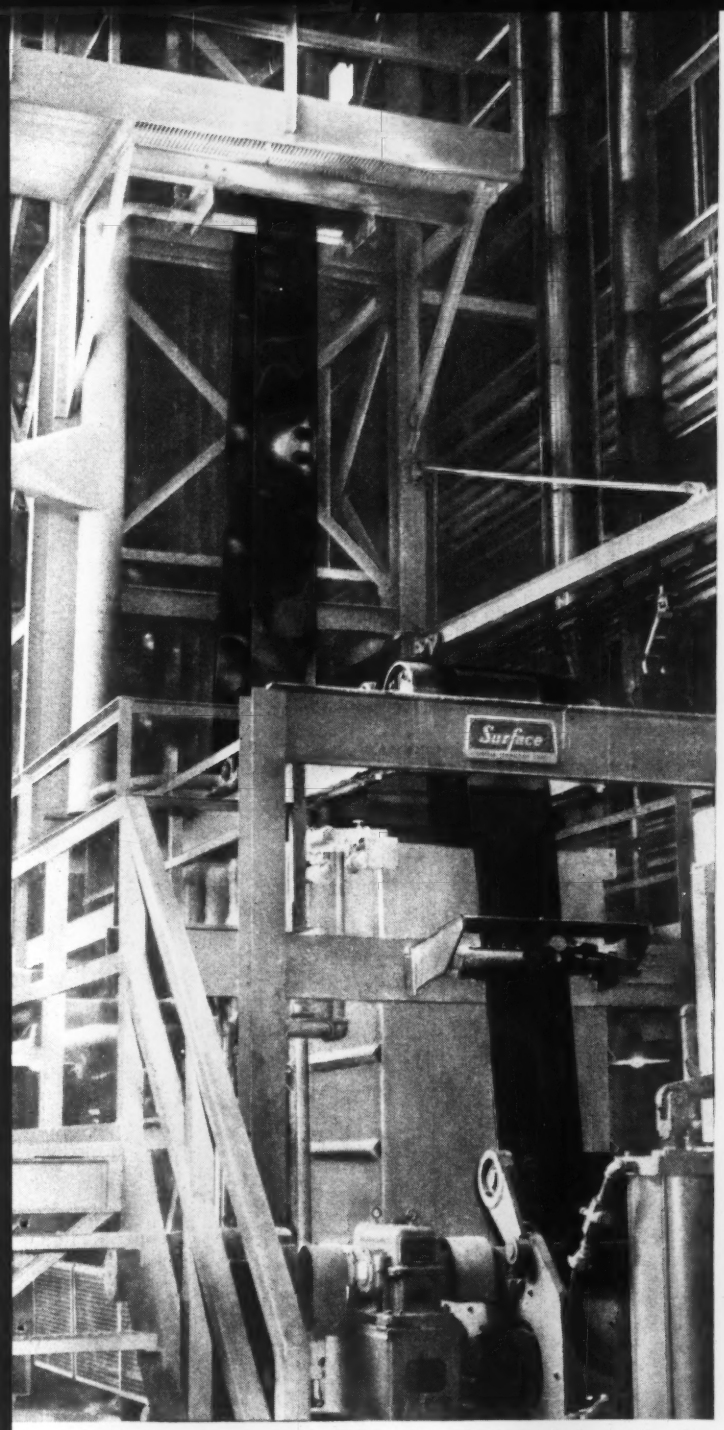
The Air Materiel Command, for example, is pushing a program to develop new production knowhow. Through its Manufacturing Methods Branch, it is spending about $15 million a year to finance industry studies. Object: To learn better ways to make aircraft and missiles.

It has about 120 different contracts. They cover such things as high velocity machining, explosive forming, adhesive metal bonding, and electronics. The list of contractors reads like a who's who in American industry.

Two of the requirements for AMC money: The project must show an aircraft need and benefit, and it must be proved practical. If it's a new process, you have to sell AMC on the fact that it will work, then it'll help you finance the program. Say your idea is for a new product; you'll be expected to have a working model—AMC will help you get it into production.

An aircraft production man told STEEL: "We are continually faced with new problems we don't know how to approach . . . with new jobs our conventional equipment won't handle."

You can sell your company short by hanging its future on product evolution. Revolutionary ideas are needed.



General view of entry end of annealing line.

at Bridgeport Brass Company, Indianapolis, Indiana

Continuous annealing and pickle line with USS LORIG-ALIGNER Strip Tracking System increases capacity 12,000 lbs. per hour

THE installation of the Bridgeport Brass continuous annealing and pickle line in August 1957 has increased their strip producing capacity 12,000 lbs. per hour, with a corresponding increase in over-all quality and yield.

"There's over 800 feet of strip in this line," says Plant Engineer R. J. Gardner. "And we have no trouble with strip centering or alignment. The LORIG System has prevented tracking problems."

The LORIG-ALIGNER Strip Tracking System is adaptable to processing lines in both the ferrous and nonferrous metals fields and provides constant control of strip or web alignment. Centering and aligning forces are inherent in the "system" since the specially designed complement of rolls has the ability to maintain strip material on the strip pass-line without the use of complicated exterior sensing and control devices.

For additional information about the LORIG-ALIGNER Strip Tracking System, fill in the coupon.

USS and LORIG-ALIGNER are registered trademarks

The brass strip passes over a Type II LORIG-ALIGNER Roll and under the pinch roll as it enters the line cleaning unit. Shown here are Mr. Fred Ennis, Foreman; Mr. R. J. Gardner, Plant Engineer; and Mr. W. C. Roll, Supervisor of Plant Enginering, Bridgeport Brass Company's Indianapolis plant.

United States Steel Corporation—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Export Company

United States Steel

USS

United States Steel
Room 2801, 525 William Penn Place
Pittsburgh 30, Pa.

Please send your booklet, "LORIG-ALIGNER Self-Centering ROLLS."

Name _____

Company _____

Address _____

City _____ **State** _____

(Please Print)

Double Plate Protects Moly

It prevents oxidation of the metal for more than 1000 hours at 1796° F. Developers of technique say it fills a need on high temperature parts, like turbine blades

AN ELECTROPLATED coating of nickel over chromium may be the solution that designers of high temperature parts have been looking for to make molybdenum useful.

Although it has far better structural strength at high temperatures than steel, it oxidizes readily at elevated temperatures and must be protected.

• **Oxidation Halted**—The chromium-nickel coating was developed by the National Bureau of Standards for the Navy Bureau of Aeronautics. It prevents oxidation of molybdenum for more than 1000 hours at 1796° F. and for more than 300 hours at 2012° F. The two-layer coating has been recommended for use on turbine blades and other high-temperature parts.

The composite coating is oxidation resistant, nonporous, and ductile. Minute imperfections in the plate would allow the molybdenum to oxidize and disappear completely within a few hours.

• **Plating Procedure**—The first step in applying the coating is to etch the molybdenum with a 1:1 solution of concentrated sulfuric and phosphoric acids. A 1-mil chromium deposit is electroplated on the metal. Then the plated surface is etched with a 1:1 hydrochloric acid, given a nickel strike, and plated with 7 mils of nickel.

For this purpose, the nickel deposited from a Watts type bath is superior to that deposited from an all-chloride bath, says the National Bureau of Standards.

• **Causes of Failure** — In metallurgical examinations of a series of the coated specimens which had been subjected to different periods of air oxidation at 2012° F, three causes of failure were noted: Subsurface oxidation, grain-boundary oxidation, and edge separation.

Subsurface oxide is due to a reaction with atmospheric oxygen and not with oxygen trapped in the coating. The oxide was not found in samples heated in a helium atmosphere.

Apparently, the oxide layer is caused by diffusion of the oxygen which passes through the nickel coating and reacts with the nickel-chromium alloy underneath.

The boundaries of the metal crystal are more vulnerable to oxygen attack.

Edge separation occurs within the chromium-nickel diffusion nickel layer when a sample is alternately heated and cooled several times. This type of defect produces a gap within the layers.

The Autrometer automatically prints a tape that shows the results of its findings

X-Rays Speed Alloy Check

Time for batch analysis has been reduced from days to a few minutes. This quality control unit compares samples against standards, shows amounts of each element

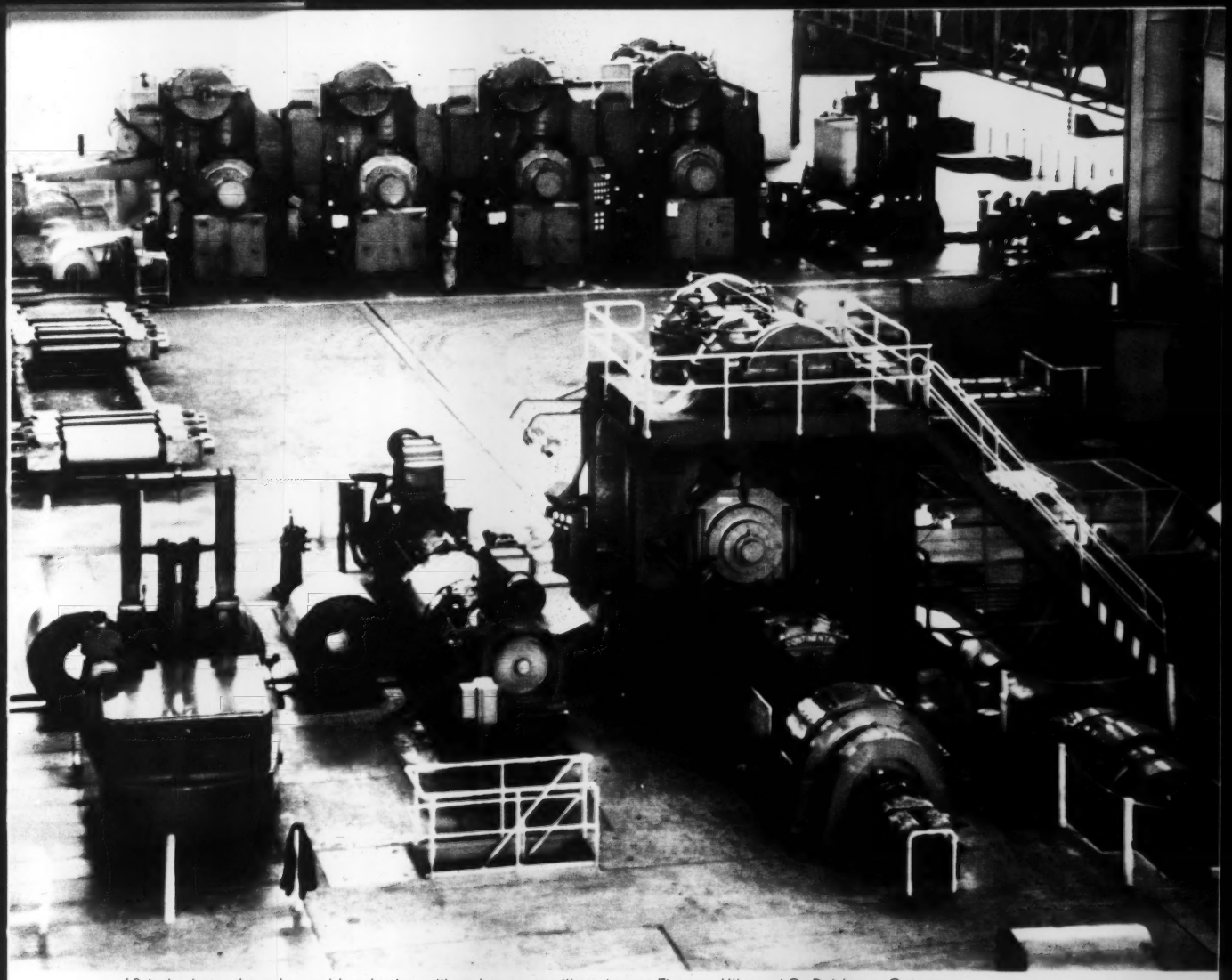
AN AUTOMATIC, x-ray fluorescent spectograph that enables a heat (or batch) of metal to be analyzed quickly and accurately, has been developed by North American Philips Co., New York.

Called the Aurometer, it compares a sample against a known standard by bathing each alternately in an intense beam of x-rays.

The amount of each element in the alloy can be measured by the intensity of the radiation given off.

The instrument automatically prints a tape which records the results in the form of a ratio between the standard and the sample. The data are then checked to determine if the alloy meets the chemical composition requirements.

Haynes Stellite Co., a division of Union Carbide Corp., Kokomo, Ind., is using the device as a part of its quality control equipment.



60-inch, 4-stand tandem cold reduction mill and temper mill at August Thyssen Hüette AG, Duisburg, Germany.

BLAW-KNOX
COLD STRIP MILLS

Blaw-Knox designs and builds all types of cold reduction and temper mills for ferrous and non-ferrous work. Other Blaw-Knox equipment for the metals industry includes complete rolling mill installations including all auxiliary equipment for ferrous and non-ferrous metals, iron, alloy iron and steel rolls, Medart cold finishing equipment, carbon and alloy steel castings, fabricated steel plate or cast-weld design weldments, steel plant equipment, and heat and corrosion resisting alloy castings.

BLAW-KNOX

BLAW-KNOX COMPANY

Foundry and Mill Machinery Division
Blaw-Knox Building · 300 Sixth Avenue
Pittsburgh 22, Pennsylvania

Chemical Prepaint Treatments for Metal Surfaces

What they do, the types available, how they are applied

By J. H. GEYER
Manager, Product Development Dept., AMCHEM PRODUCTS, INC.

Paint systems have been steadily improved in an effort to produce more decorative, easier-to-apply, and more corrosion-resistant films. The ability, however, of any paint film to perform its predetermined functions cannot be fully utilized without properly preparing the metal surface.

The prepaint preparation of the metal surface is therefore a highly important part of the system. Chemical prepaint treatments are designed to do four jobs and do them well. First, they remove organic soils, shop dirt, scale, and rust or corrosion products from the metal surface. Second, they provide surfaces that are completely compatible with subsequent paint films. Third, they produce a *tooth* that promotes good paint film adhesion. Fourth, they effectively prevent underpaint corrosion growth after any breakthrough in the paint film.

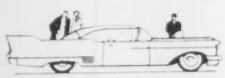
Basically, there are four types of chemical prepaint treatments. These are phosphoric acid, iron phosphate, zinc phosphate, and amorphous phosphate or chromate. Each is discussed briefly in the following paragraphs.

Phosphoric Acid

Perhaps the most widely used and certainly one of the most economical chemical prepaint treatments is the phosphoric acid cleaner combination materials. ACP Deoxidine® is such a material. It removes organic soils, rust, scale and contaminating elements from the metal surface. It also produces a light etch on steel, aluminum or zinc surfaces which considerably aids in increasing paint adhesion. It does not, however, form an actual coating on the metal surface. Any breakthrough in the subsequent paint film will permit underfilm corrosion to proceed. Grades of Deoxidine are available for application by brush or swab, hot and cold dip, or hot spray.

Iron Phosphate

Iron phosphating processes are extensively used in the chemical prepaint treatment of appliances such as water heater shells, ranges, washers, dryers and other *white lines*. These processes will produce excellent paint-bonding films on the metal and retard or prevent underpaint corrosion. Duridine,® ACP's iron phosphating process, is a combination organic soil cleaner and iron phosphate coating material. Both the cleaning and coating operations take place in the same bath. Duridine and other iron phosphates do not lend themselves to brush-on application, are primarily designed for spray type equipment of four or five stages. But several dip installations are successfully operating today by inclusion of an alkali precleaning stage.



Zinc Phosphate

ACP Granodine® is an example of this type of chemical prepaint treatment process, the type now being used to treat steel in the automotive industry, and predominantly specified for steel ordnance and military items. This process forms a coating which offers the ultimate in paint adhesion promotion and vastly augments the corrosion resistance of subsequent paint films. Zinc phosphate materials are extremely flexible as to method of application—can be applied by brush, dip or automatic spray equipment. In a typical dip or power spray system, the stages would be alkali clean, water rinse, zinc phosphate treatment, water rinse, and acidulated final rinse. If the metal has considerable areas of rust or scale, an acid pickle is advisable following the alkali cleaning stage.

On zinc surfaces, the zinc phosphates perform a rather unique function. They act as a barrier against chemical reaction between the applied paint film and the zinc surface. This effectively prevents blistering of the paint and early breakdown of the film. This is in addition, of course, to the improvement of paint adhesion and the retarding of underpaint corrosion. ACP Lithoform® is specially designed for use over zinc surfaces and finds wide application as a prepaint treatment for ornamental zinc die castings, refrigerator liners, and on most galvanized work requiring painted finishes.

Amorphous Phosphate and Chromate

These coatings are the films produced by the ACP Alodine processes and similar ones on aluminum surfaces. They have met with wide acceptance in the prepaint treatment of venetian blind strips, refrigerator liners, aluminum heat transfer units, aircraft sheet metal assemblies, and many other items fabricated from aluminum. The various coatings provide an excellent film for the promotion of paint adhesion and effectively prevent underfilm corrosion. As in the case of zinc, aluminum exhibits a tendency to chemically react with some paint systems. The Alodine processes develop a barrier film between the paint and the aluminum surfaces which prevents this reaction. The Alodines are extremely versatile materials that can be applied to aluminum surfaces by brush, hand spray, dipping, mechanical spraying, or roller coating equipment. Brush application is particularly well adapted to the processing of parts too large for simple dip systems or in manufacturing operations that do not warrant a tank setup. In dip, spray or roller coating application, the system usually consists of an alkaline preclean, a water rinse, the Alodine treatment, a water rinse, and an acidulated final rinse. Where the surface is heavily oxidized, a deoxidizer in the line is needed.

The major chemical prepaint treatments for metals have been covered briefly in this article. More complete information can be had by contacting an ACP sales representative or by writing us at Ambler, Pa.

Amchem Products, Inc.
Ambler 19, Pa.
CHEMICALS ACP PROCESSES
Formerly
AMERICAN CHEMICAL PAINT COMPANY
DETROIT, MICH. • ST. JOSEPH, MO.
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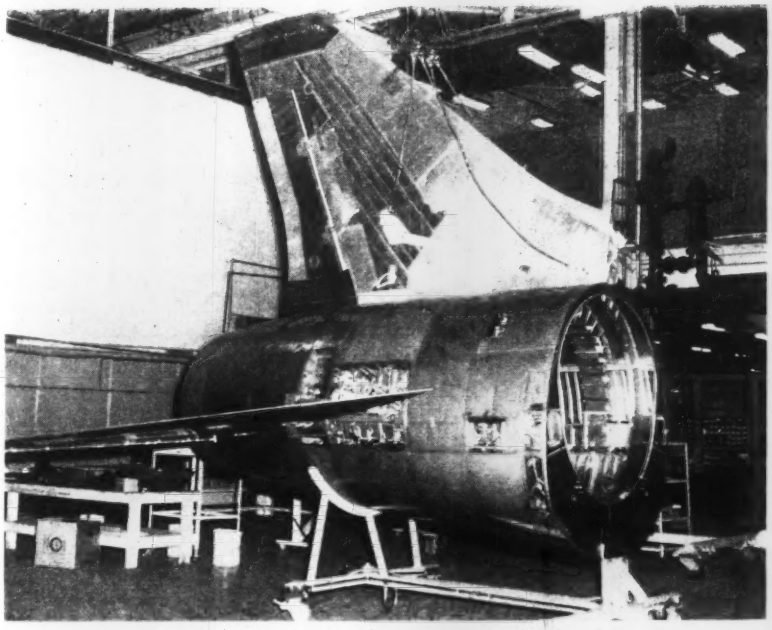
New Chemical Horizons for Industry and Agriculture



A major advancement in making the Crusader aft section was the spotwelding of AMS-4908

Titanium Fabrication Advanced by Spotwelding

GONE is the need for additional frames, stiffeners, and angles in advanced aircraft design. It disappeared with the advent of a composite of beaded, commercially pure, titanium inner skins spotwelded to 8 per cent manganese alloy outer skins.

Other benefits: Reduction in the amount of titanium and number of fasteners needed, resulting in time and weight savings.

• **Thought Impossible**—Early development of a composite titanium panel required the close co-operation of designers, engineers, and manufacturing personnel at Chance Vought Aircraft Inc., Dallas. In 1953, when the original production application was utilized, many users of titanium considered the spotwelding of alloyed titanium impossible.

The spotwelding of skins, frames, and bulkheads provided aircraft sections with minimum weight to satisfy design requirements. It was first specified in the fuselage aft section of the F8U-1 Crusader.

Later, it was possible to design a structure for the advanced and larger F8U-3 Crusader III with lower weight than that of the earlier model. An access panel for either plane weighed 2.3 lb per sq ft when made by conventional methods. The new method brought the weight down to 1.6 lb per sq ft.

• **Operations Reduced** — Previous forming methods required separate stress relieving operations and fixtures. Chance Vought engineers developed a technique that eliminated separate stress relieving by the application of heat and pressure during the final press forming. Panels as large as 32 x 40 in. with a curvature depth of 6 in. have been formed successfully.

Pull Shrinks Alloy

Some alloys contract during creep test because of changes in their granular structure

IN SOME CASES, alloys will shrink rather than stretch during a creep test, R. W. Fountain and M. Korchynsky told the American Society for Metals at its annual convention in Cleveland. They were reporting on work done at the Metal Research Laboratories, Electro Metallurgical Co., a division of Union Carbide Corp.

Measured creep elongation is the sum of true plastic deformation and length change caused by structural instability, they said.

• **Other Observations** — In most cases, the plastic elongation and structural changes combine to lengthen the tested sample. Often, however, solid state reaction in the alloy is negative and greater than the stretching force applied, and negative creep, or contraction, actually occurs.

Study of negative creep tendencies of iron-tungsten and nickel-molybdenum alloys showed that the amount of contraction could be calculated from reliable crystallographic and equilibrium phase data.

In a stress relaxation test, stress increased to maintain a constant strain condition as the sample contracted. That quality might be useful in high temperature bolting applications. Alloys showing a high negative creep tendency might be difficult to anneal after cold working, because of internal stresses which would cause cracking. High heating rates for annealing were suggested to reduce such damage.

Clear Anodize Developed

A clear anodic coating for magnesium alloys that can be applied in less than a minute has been developed by Dow Chemical Co., Midland, Mich.

The treatment is used under a lacquer or varnish for maximum corrosion protection. Lacquer or varnish tinted with commercial dyestuffs can be applied over the clear coating to obtain a transparent effect in a variety of colors.

How To Use

You can save floor space and streamline production in your plant by storing part stock and finished goods from floor to ceiling, using high lift, handling equipment

ARE YOU taking full advantage of your vertical storage space?

Here are two case studies which point up the potential in this often neglected area of cost cutting. They'll start you thinking on ways you can save in your plant.

In the first example, a floor-to-ceiling storage system permits more efficient handling of bar and rod stock.

In the second, a combination of component and finished product inventories saves storage space and beefs up production.

Case No. 1

A high reaching stacker crane, used with a system of Christmas-tree storage racks, saves manpower and valuable floor space in the new Allen Mfg. Co. plant, Bloomfield, Conn.

The aerial storage system, installed by Walter Kidde Constructors Inc., offers a more efficient method of handling bar and rod stock (formerly a manual job).

• **Aerial Game**—The key to the system is a one-man stacker crane that hangs from an overhead rail system. Carrying the operator with it, the crane rides forward, backward, right or left at 125 fpm; travels up or down at 20 fpm. Forks on either side of the machine permit the servicing of racks on either side of the 5-ft aisles.

• **Steel Storage Racks**—The storage area consists of five rows of Christmas-tree racks, each about 15 ft high, with bases supported by 6-in. steel beams embedded in the 12-in. concrete floor. The three inside rows have arms on both sides; the two outside racks have arms only

Your Air Rights

on the inside. Each upright has arms at eight levels; three uprights in a row form a unit for handling typical 12-ft bundles of rods or bars. Each of the three-arm decks can hold a bundle weighing as much as 6000 lb.

• **Stock Handling Streamlined** — The operator places incoming goods in storage, or collects stock to fill requisitions. He can pick up any order—a single bar or a bundle.

The sequence of orders is arranged so the operator can select all items in one run through the aisles.

Case No. 2

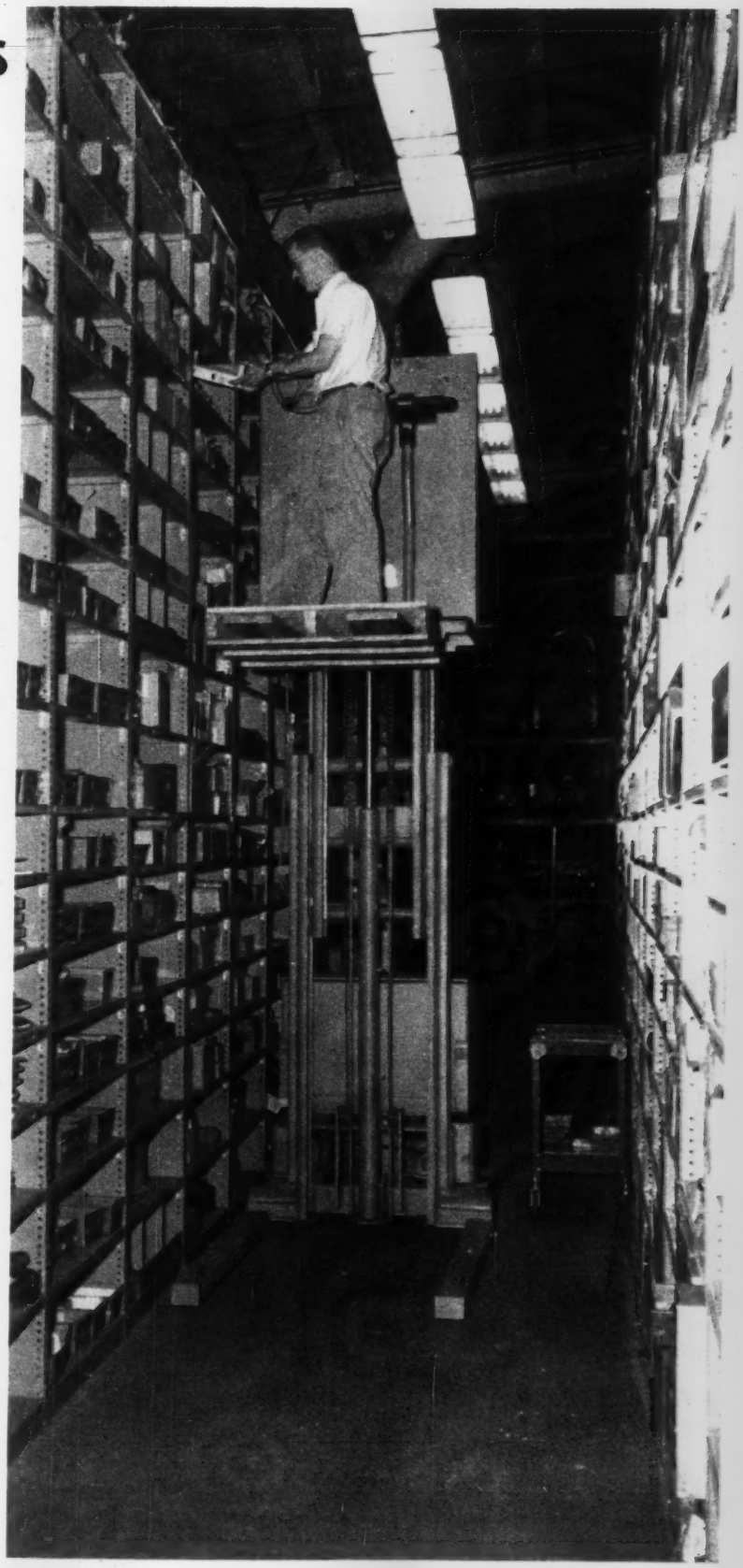
Modern stock moving equipment made it possible for B-I-F Industries Inc., Providence, R. I., to increase production and save floor space.

The technique: Modern stock moving equipment was used to consolidate three component stockrooms and seven finished goods sections in a centralized, high-stacked storage area.

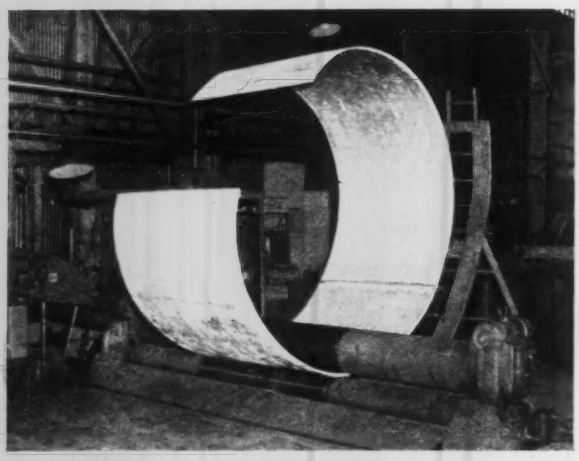
• **Equipment**—Two types of high-lift, electric JackStacker trucks (made by Lewis-Shepard Products Inc., Watertown, Mass.) move parts to and from storage bins and shelves as high as 16 ft. Two small JackStackers handle loose parts in less than pallet loads; a heavier, counterbalanced one handles loads on skids or pallets.

The smaller trucks have dual controls and can be operated from the floor or from the truck platform. The stock clerk, riding on the platform, drives down the aisles, stopping to raise or lower the platform to reach storage bins.

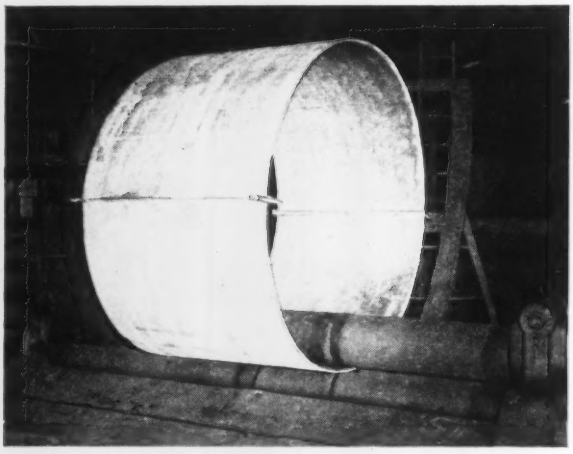
• **Saving**—Aisle space was trimmed to 900 sq ft (from 2000) by two moves: The use of trucks which require a minimum of aisle space and more efficient use of floor space in the assembly area. The 5½-ft aisles allow 1½ ft clearance for personnel walking through the storage area while the trucks are working.



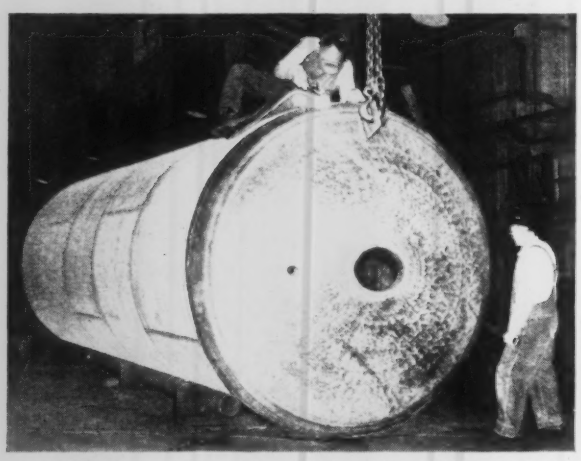
Tanks, heat exchangers and processing equipment for tough jobs are fabricated quickly and easily of corrosion-resistant Everdur®



At Old Dominion Iron and Steel Corporation, Belle Isle, Richmond, Virginia, *(O.D.I.S.), fabricators of tanks, heat exchange equipment and pressure vessels,* two plates of Everdur-1010 (131" x 56⅜" x .313"), previously welded together, are rolled to form a cylindrical tank section.



When rolling is completed the beveled edges of the plates are butted to form a vee groove which then will be welded to complete the section. Five such sections will be put together by *Old Dominion Iron & Steel Corporation* to make the 26'-9" shell of the storage heater.



The storage heater is completed by attachment of two flanged and dished heads 96" outside diameter. The heads were press-formed and spun by *Old Dominion Iron and Steel Corporation* from circles of Everdur-1010, 104" in diameter and .674" thick.

The completed 10,000-gallon storage heater has 196 feet of welds. All welding was done with the inert-gas tungsten-arc using Everdur-1010 Welding Rod, which makes welds that meet ASME Boiler and Pressure Vessel Code requirements for soundness, strength, ductility.

EVERDUR-1010 provides the high strength and excellent corrosion resistance needed for all kinds of hot-water storage tanks and for pressure vessels and equipment used in the chemical and processing industries. This tank will be used for hot-water storage in a wool-dyeing plant.

High-strength, corrosion-resistant alloys, basically copper and silicon, are made and sold by The American Brass Company under its trade-mark, Everdur. They were developed for structural and engineering uses which require metals of high tensile strength combined with immunity to rusting, and corrosion resistance equivalent to that of copper. Everdur alloys are nonmagnetic, highly resistant to fatigue, and, depending on the alloy, suited to hot or cold working and economical fabrication by welding. 6810A

EVERDUR®

COPPER-SILICON ALLOYS

Products of

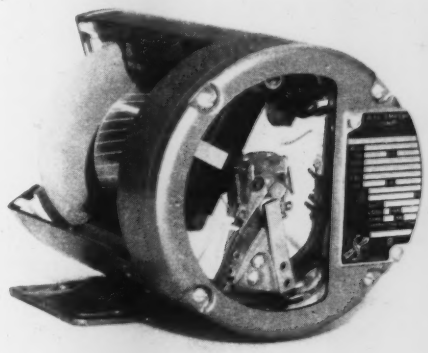
Made by The American Brass Company

Encased Controls Reduce Single-Phase Motor Failures

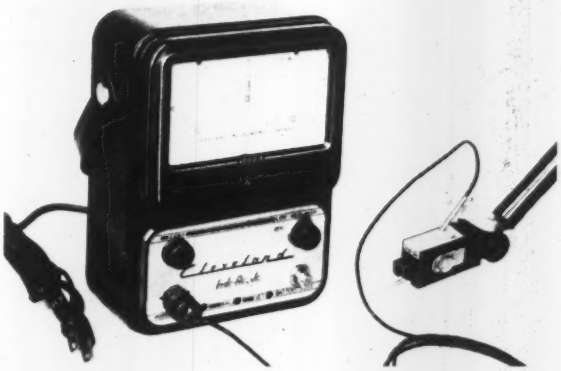
Sealed protection for the starting switches is the main feature of these electric motors. Complete encasement of the switch, capacitor, thermostat, and terminal board stops the entry of dirt, dust, and processing material fines, and prevents oily accumulations.

The starting switch has a self-cleaning scissor action, uses anticarbonization alloy contacts, and is actuated by the governor through a nylon button. The switch design is being adapted to every model in the firm's single-phase motor line.

The motor also has prelubricated and sealed ball bearings, and a locked-bearing arrangement limits end play, and assures even transfer of power. *Write*: Electric Motor Div., A. O. Smith Corp., Tipp City, Ohio. *Phone*: Uptown 3-3000



Low Cost Precision Electronic Gage Is Portable



The Indi-Ac Jr. is a transistorized electronic gage whose three-color coded scales range from less than 0.000020 to 0.020 in.

This portable unit is adaptable to battery or alternating current operation. The battery is recharged when the unit is connected to 115 volts ac.

The lightweight, compact head is protected from oil, grit, magnetic fields, and careless handling or accidents.

No rezeroing is necessary in changing scales as zero points and readings are transferable from one scale to another.

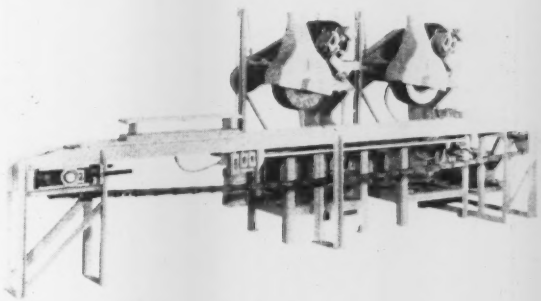
By turning a knob, the reversible action of the gage tip permits gaging from top or bottom of a surface. *Write*: Cleveland Instrument Co., 735 Carnegie Ave., Cleveland, Ohio. *Phone*: Prospect 1-7070

Buffing Automated with Reciprocating Machine

This reciprocating buffing machine is fully automated and is delivered as a package, wired for immediate use. It can be used for low and high production.

For short runs, the conveyor may be run with a forward and reverse motion under the heads. For high production, the conveyor is run continuously under the desired number of fixtures. As a continuous buffer, parts 4 ft long can be handled.

Buffing heads are the full-floating type, balance weights being used to adjust pressure. A swivel adjustment at the base of each head permits cross buffing when desired. *Write*: Wilson Buffing Chuck & Machine Co., 22730 Dequindre, Warren, Mich. *Phone*: Slocum 4-0634



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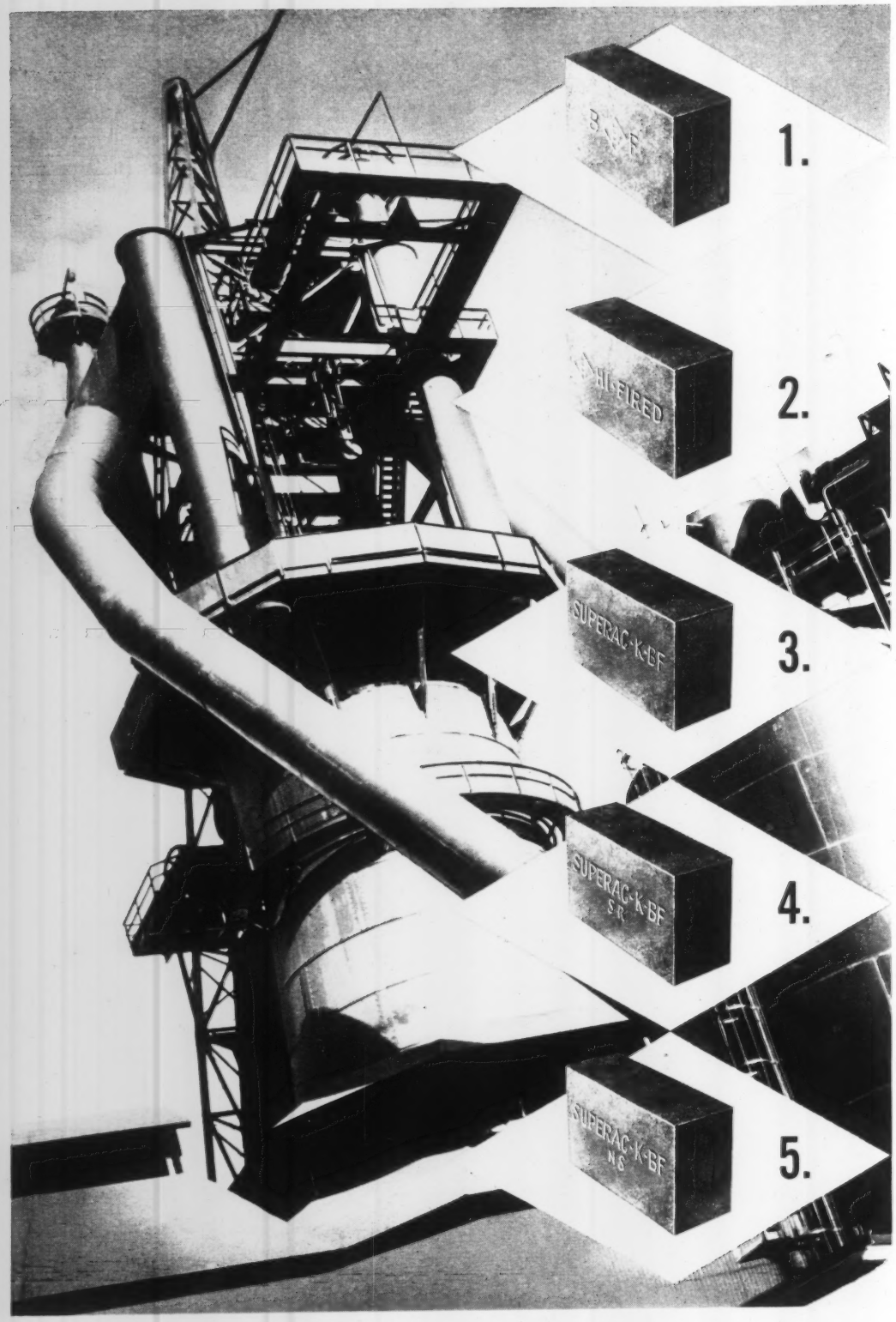
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2.
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SUPERAC-K-EF
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SUPERAC-K-BF
S.S.
5.
SUPERAC-K-BF
M.S.

GREFCO OFFERS 5 SUPERIOR BLAST FURNACE BRICK

To meet the increasingly specialized demands of modern iron making, GREFCO now offers five different outstanding blast furnace bricks, each tailored to meet your requirements.

1. OLIVE HILL-BF — High duty fireclay brick for blast furnace linings. Now and for many years a standard of the industry.

2. OLIVE HILL HI-FIRED — Especially fired at high temperatures to combine the advantages of OLIVE HILL-BF with greater resistance to carbon disintegration.

3. SUPERAC-K-BF — The general purpose, high fired, superduty blast furnace brick having properties tailored to meet a variety of service conditions.

4. SUPERAC-K-BF (*SR*) — The high fired, superduty blast furnace brick with exceptional density, strength, and slag-resistant properties. Used frequently in bottom blocks and wearing plate areas.

5. SUPERAC-K-BF (*NS*) — The high fired, superduty blast furnace brick with exceptional resistance to spalling. Sometimes preferred for stack linings.

Your GREFCO representative will be glad to discuss with you the GREFCO blast furnace brick best suited to meet the conditions in your furnaces.

GENERAL REFRACTORIES COMPANY

Philadelphia 2, Pa.

GENERAL REFRACTORIES COMPANY

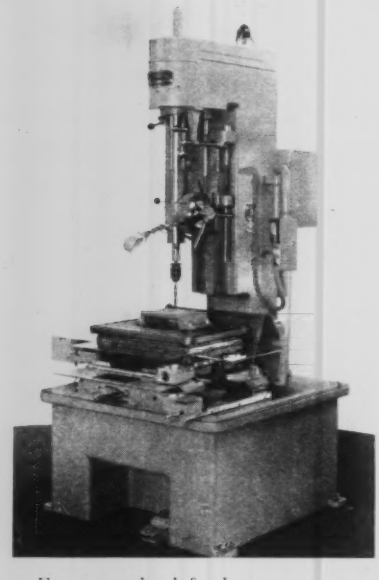
A COMPLETE REFRACTORIES SERVICE

NEW PRODUCTS and equipment

Layout Made Economical

The No. 2 layout machine performs center drilling, drilling, and reaming in parts that do not require jig boring tolerances.

It accepts several makes of compound tables in hand operated, semiautomatic, and automatic programmed types.

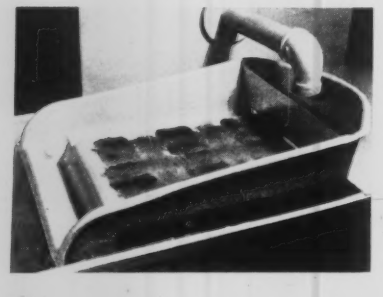


Four standard feed rates are provided in direct drive, four heavier ones in back gear drive. Rated capacity of the machines is 1 in. in cast iron; 7/8 in. in mild steel. *Write*: Edlund Machinery Co., 44 Huntington St., Cortland, N. Y. *Phone*: Skyline 6-5661

Separator Cleans Coolant

The Kebby Mite coolant cleaner is an efficient magnetic separator that removes ferrous materials from grinding and other metalworking coolants.

Its durable Fiberglas tray is supported by a retainer plate of Alnico magnets. The unit has a capacity of 15 gpm. *Write*: Kebby Co., 2320 Custer Ave., Rockford, Ill. *Phone*: 3-1466



Treats Friction Parts

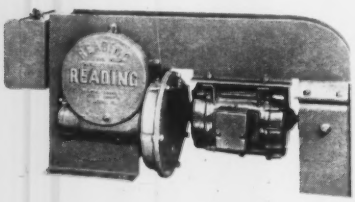
The Duralube processing unit provides an efficient method for treating metal friction parts with a protective oil absorbent coating.

It is designed for use in treating many types of parts that are benefited by lubricant impregnation, Parkerizing, or Bonderizing. A smooth wear-in operation is given parts, and galling, scoring, or welding is prevented. *Write*: Durabilt Co., 7500 Maie Ave., Los Angeles 1, Calif. *Phone*: Ludlow 3-1351

Hoist Speeds Production

Designed to reduce heat preparation time for melting steel, this 1-ton electric hoist controls lowering and raising of the oxygen lance used in open hearth furnaces.

Its worm gear construction permits brakes to be placed on the opposite end of the worm from the drive gear, or they may be mounted on the motorshaft extension.



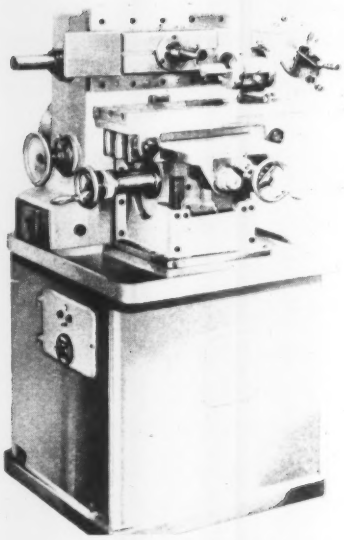
This hoist is equipped with a complete control mechanism, or it can be adapted to control equipment in use. Most units are operated by remote control. *Write*: Reading Crane & Hoist Corp., Reading, Pa. *Phone*: Franklin 4-8238

Shaper Machines Contours

Machining tapered punches of forms within a range of ±3 degrees is a feature of the K-15 universal shaping machine.

It produces contours of all kinds, surfaces, and punches with curved necks to a guaranteed tolerance of ±0.00025 in. in one setup.

The shaper employs a large dividing head with automatic circular feed and co-ordinate chuck permitting automatic machining of radiuses, angles, and tapers. *Write*: Jersey Mfg. Co., 453 Livingston St., Elizabeth, N. J. *Phone*: Elizabeth 4-8222



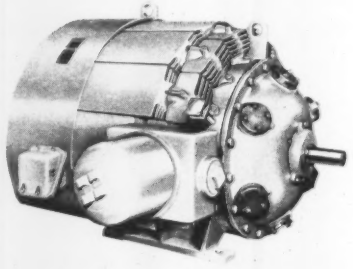
Coating Protects Parts

A spray-on coating, called Sabrex, provides low cost protection of parts during manufacture and tooling protection during storage. It can be applied to magnesium, aluminum, iron, and steel. Spraying with an inexpensive solvent or steam cleaning will remove the coating. *Write*: Navan Products Inc., International Airport, Los Angeles 45, Calif. *Phone*: Oregon 8-5615

Speed Range Is Wide

A direct current heat exchanger motor provides a wide, adjustable speed range (it can be operated at constant speed). Ratings from 25 to 300 hp are available.

The unit can be had in an explosion proof enclosure (Class I, Group D underwriters' label), or with standard enclosed construction



There is no substitute for stainless steel
in automobiles

No other material is as bright, strong and resistant to rust and wear as Stainless Steel. It gives every car the clean, exciting beauty that sells in the showroom and re-sells on the used car lot. Look for *Stainless Steel* on your new automobile.

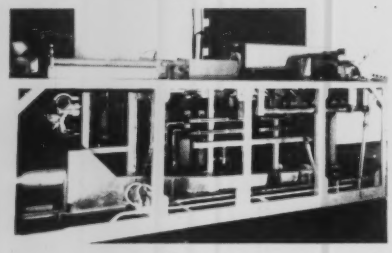
Specify McLouth high quality sheet and strip Stainless Steel. McLouth Steel Corporation, Detroit 17, Michigan.

McLouth Stainless Steel

PITTSBURGH INDUCTION HEATING COMPANY'S COMPLETE SERVICE SOLD ME

Says **TOM COOPER** *Executive Vice President*
International Aluminum Corp.
3765 - 74th Street • Miami 47, Florida

Mr. Cooper should know. As he notes: "Our new PIH Induction Heater has the largest production capacity of 6-inch diameter billets of any single-coil induction heater in the aluminum extrusion industry." Some of the extra services they received (and available to all PIH customers):



PRE-TESTING: The PIH heater was tested prior to delivery. Mr. Cooper was invited to witness this test, in which International Aluminum billets were heated at actual plant production rates. The tests covered charging and discharging mechanism, control circuits, power circuits, billet temperature instruments and all safety devices. Mr. Cooper says: "This testing saved us time and money and assured us of a furnace ready to do the job when it was installed."

INSTALLATION: PIH Engineers visited the actual site at International Aluminum Corp., and supervised all work from installation to the beginning of production.

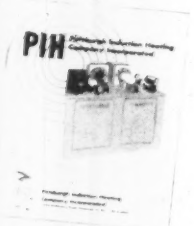
EVERY PITTSBURGH INDUCTION HEATING

installation is backed by these outstanding features...

- **Heavy-duty Construction**
- **One-Year Warranty**
- **Maximum Safety**
- **Labor and Space Savings**
- **Greater Margin of Profit**

PIH heaters have a wide range of ferrous and non-ferrous applications, can cut your costs and operating time, increase profits. Consult a PIH Engineer, learn the advantages of induction heating for optimum heating of all metals for extrusion, forging, rolling, annealing and other purposes.

Send for detailed brochure with frequency graph on Induction Heating.



PIH

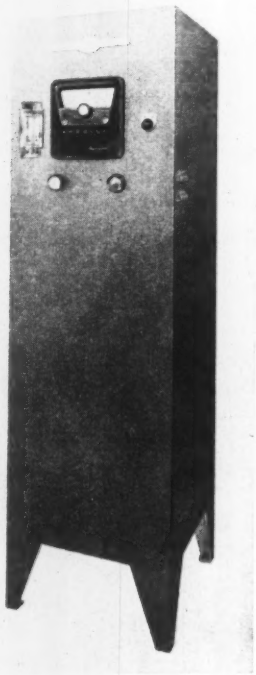
Pittsburgh Induction Heating Company Incorporated

615 WASHINGTON ROAD, PITTSBURGH 28 PA. • Phone LO. 3-6020

for abrasive airborne particles, dirt, coolants, moisture, oil vapors, and severe atmospheric conditions. *Write*: Dept. P., Louis Allis Co., 427 E. Stewart St., Milwaukee 1, Wis. *Phone*: Humboldt 1-6000

Gas Generator Improved

Type IGL Generators deliver precisely controlled, medium or high carbon-potential protective atmospheres for heat treating the more difficult and complex steels, carbonitriding mild steels, and for controlled sintering operations.

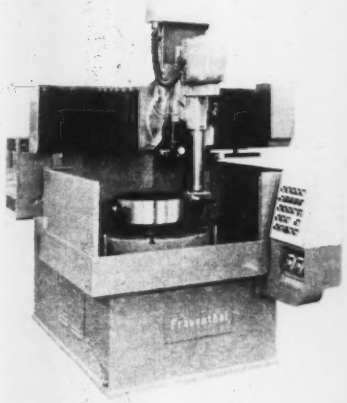


They permit accurate control of gas-to-air ratio, retort chamber temperature, "carbon-pressure," and low dew point. *Write*: C. I. Hayes Inc., 822 Wellington Ave., Cranston, R. I. *Phone*: Hopkins 1-3400

Grinds Variety of Jobs

Designed for a variety of grinding applications, the 1200 Series grinding machine is a fixed rail type, available in two sizes and two models.

The 1224 has a 24-in. diameter table with a 36-in. maximum swing capacity. The 1236/42 has a 36 in.



or 42 in. diameter table with 48-in. maximum swing capacity.

They are available with belt driven or direct connected grinding spindles. *Write*: Frauenthal Div., Kaydon Engineering Corp., Muskegon, Mich. *Phone*: 5-1641

Filter Hangs in Tank

The In-the-Tank Filter hangs on the plating tank wall.

A 300-gpm pump draws the solution through the filter unit and returns it clarified to the tank. Multiple filters units can be used if required.

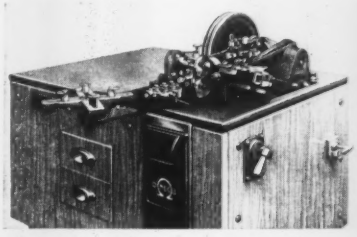
The standard filter bag is paper. No precoat of filter aid is required for most solutions. The units can be supplied for all acid or alkaline use. *Write*: Belke Mfg. Co., 944F N. Cicero Ave., Chicago 51, Ill. *Phone*: Mansfield 6-4606

Small Parts Cold Headed

The Omega "00" provides quick and accurate cold heading of miniature parts. Parts as small as 0.012 in. in diameter and 0.016 in. long can be produced.

It is a standard solid die, double stroke heading machine that cuts to length, heads, and forms between 80 and 120 pieces a minute.

The unit provides close tolerances,

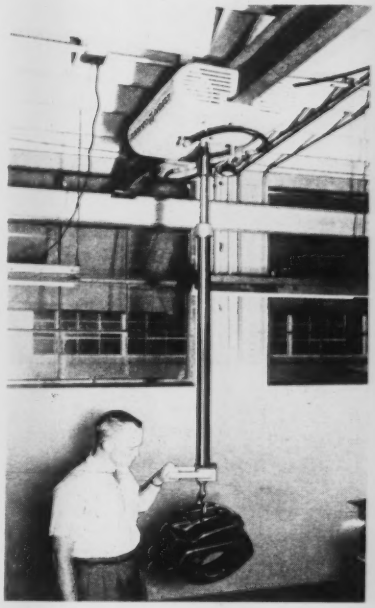


and is supplied with one set of dies to make a specific piece of customer's choice. *Write*: Robert E. Morris Co., 5004 Farmington Ave., West Hartford, Conn. *Phone*: Orchard 7-0621

Hoist Responds Quickly

These electrohydraulic Servo-Hoists come in nominal capacities of ¼, ½, 1, and 2 tons. Material can be raised to 10 ft.

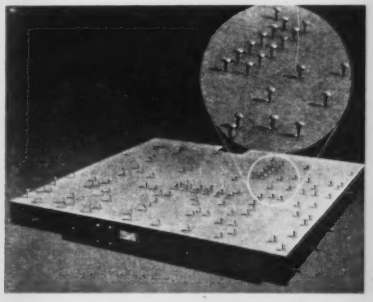
Precision positioning, adjustable-speed action, one-hand operation, and finger tip control are featured.



Variation within speed range is stepless and infinitely adjustable. *Write*: Automatic Warehousing Branch, Pesco Products Div., Borg-Warner Corp., Wooster, Ohio.

Plate Has Inserts

Threaded steel inserts make it possible to attach various components to a granite surface plate. When the inserts are cemented into



position, they are stronger than the machine screws used with them.

The technique facilitates the use of granite angle plates. Clamping strips can now replace large C-clamps. *Write*: Rahn Granite Surface Plate Co., 641 N. Western Ave., Dayton 7, Ohio. *Phone*: Melrose 1951

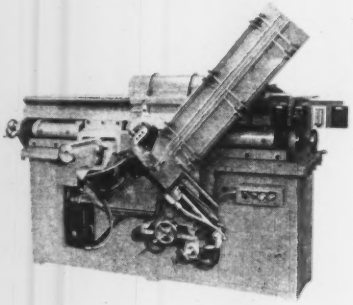
Fluid Limits Heat

Tap-Cut 35 is a heavy duty, sulfur-free cutting fluid for ferrous and nonferrous metals.

The compound is reported to act in a heat limiting capacity on low and medium tensile steels to keep interface temperatures below the critical points, retarding tool wear. *Write*: United Laboratories Inc., 303 U. B. Bldg., Huntington, Ind. *Phone*: 718

Trims Drawn Shells

Two machines, Model No. ST-5 and No. ST-6, trim drawn shells. One handles any shape that fits within a 16 in. diameter at rates up to 700 an hour. The other, a multiple spindle type, will handle



6-in. drawn shells at rates of about 3600 shells an hour.

A tool layout fixture is provided with the machine to facilitate making of knife templates quickly. *Write*: Dayton Rogers Mfg. Co., 2824 13th Ave. S., Minneapolis 7, Minn. *Phone*: Taylor 5-2471

Unit Powers Trucks

The Powr-Wheel offers quick, economical conversion of hand equipment to power drive. It can be permanently attached to a single truck or quickly coupled with a fleet of trucks.

Forward, reverse, steering, and brake action are in one compact unit. The driving wheel rides freely to compensate for floor irregularities and maintains constant traction. *Write*: Vanguard Engineering Co. 1908 E. 66th St., Cleveland 3, Ohio. *Phone*: Henderson 2-0755

Welds Studs to Light Gage

The PS-1 Percussive Stud Welding Unit endwelds small studs to light gage metals by a stored-energy principle. It will handle various combinations of ferrous and nonferrous metals and welds diameters to 3/16 in.

Fasteners can be welded to highly polished stainless, coated or enameled sheets, and other metals without distortion, warping, burn through, or discoloration to grain and polish. *Write*: K S M Products Inc., Merchantville 8, N. J.

Tracer Kit Has Tip Array

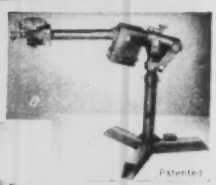
A kit containing a practical assortment of Turchan tracer tips and Arrow end mills allows selection of the proper tip for any size mill and for any type of cut.

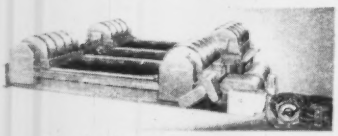
It has 26 assorted end mills, ranging from standard to long in two to four flutes, and 32 tracer tips that are coded to match the mills. All tips are precision finished and marked to match standard sizes. *Write*: Turchan Follower Machine Co., P. O. Box 6055, Dearborn, Mich. *Phone*: Webster 3-6484

ARONSON
Offers You Over 200 PROVEN Standard Stock Models of Quality POSITIONERS "POSITIONEERED" to your exact Requirements

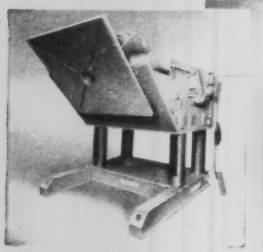
Aronson TracTred (T. M. Reg.) Turning Rolls for thin walled heavy cylindrical work to 27 tons capacity. Zero to 100 IPM turning speed and Built In Grounding.

Aronson Universal Balance Positioners (T. M. Reg.) position your weldments effectively, instantly for downhand welding. Capacities to 2000 lbs.

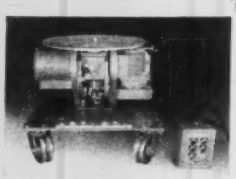




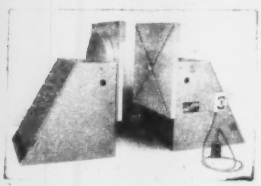
Heavy Duty Precision Built Rubber and Steel Tired Turning and Pipe Rolls. 100% overload protected. Capacities to 600 Tons.



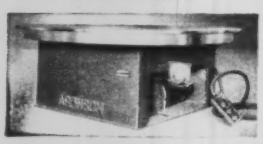
Fully Automatic Gear Driven Positioners, featuring Geared Elevation, 135° Tilting and Variable or Constant Speed Rotation. Capacities to 350,000 lbs.



Model D Gear Driven Positioners. Compact, Precise, Rugged. Capacities to 1000 lbs.

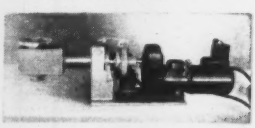


Rugged Head and Tail Stock for positioning bulky weldments between centers. Table Backup for Zero Deflection. Magnetic Braking. Capacities to 160,000 lbs. Geared Elevation Optional.



Heavy Duty Floor Turntables with precision speed control and Magnetic Braking, used for welding, burning, X-raying, etc. Capacities to 120,000 lbs., various heights and speeds.

Bench Turntable Automatic Positioners with Mercury Grounding. Capacities to 500 lbs.



Quality POSITIONERS by Aronson MACHINE COMPANY
ARCADE, NEW YORK

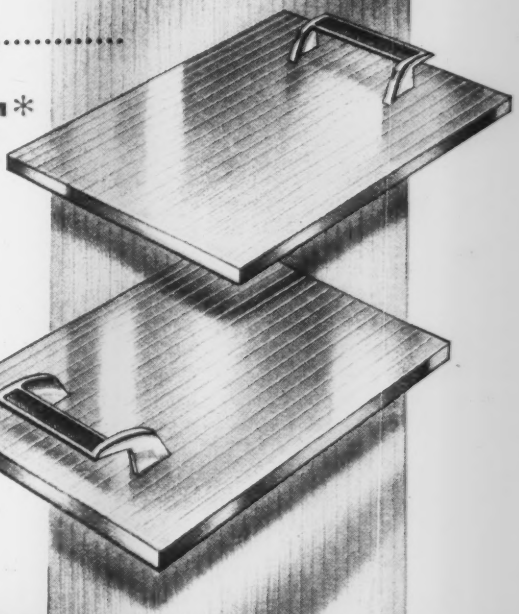
Pepsi's modern "light look" comes from

SHARONART*

The light refreshment takes on a light look—right down to the dispenser. That's Pepsi Cola and their beautifully styled new retail cooler.

Aside from appearance, the "light look" was designed for wear. This was achieved through the designer's use of Sharonart*, Sharon's amazing rolled-in pattern steel. The sliding doors, fabricated of Sharonart*, will take years of punishment without losing their bright beauty for the pattern naturally absorbs the markings of everyday use.

If you're engineering the new products for tomorrow, or updating the products of today, there are many advantages to Sharonart* that will increase design possibilities and stretch production dollars. Literature on request.



SHARONSTEEL

* TM

SHARON STEEL CORP.

SHARON, PENNSYLVANIA

CHICAGO • CINCINNATI • CLEVELAND • DAYTON • DETROIT • GRAND RAPIDS • INDIANAPOLIS • LOS ANGELES • MILWAUKEE
NEW YORK • PHILADELPHIA • ROCHESTER • SHARON • SEATTLE • SAN FRANCISCO • WASHINGTON, D.C. • TORONTO • MONTREAL

NEW literature

Write directly to the company for a copy

Diecasting Machines

Diecasting machines ranging in locking pressures from 50 to 1000 tons are described in a bulletin. Cleveland Automatic Machine Co., Cincinnati 12, Ohio.

Vibrating Screens

A catalog gives specifications on vibrating screens. Typical installations are shown. Syntron Co., 370 Lexington Ave., Homer City, Pa.

Chloride Metallurgy

A brochure details physical and chemical properties, uses, and reaction characteristics of aluminum chloride; antimony pentachloride; boron, antimony, and titanium trichloride; silicon, titanium, and zirconium tetrachloride. Special attention is given to their use in the manufacture of pure metals such as titanium, zirconium, and silicon. Stauffer Chemical Co., 380 Madison Ave., New York 17, N. Y.

Way-Type Boring Machines

A bulletin describes way-type boring machines that accept large workpieces and are designed on the building block principle. They are special purpose machines built up from standard units. Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit 32, Mich.

Spring Wire

Specifications on grades of mechanical spring wire are given in a folder (DH-107A). Information is provided on condition and tensile strength range (in psi) for soft-processed and hard-drawn types. Page Steel & Wire Div., American Chain & Cable Co. Inc., Monessen, Pa.

Gearshift Drives

A bulletin describes the construction and application of gearshift drives. Dept. 149, Lima Electric Motor Co. Inc., Lima, Ohio.

Gas-Fired Heaters

Bulletin No. 9717 describes gas-fired unit and duct heaters. Installation type drawings are presented. American Blower Div., American Radiator & Standard Sanitary Corp., Detroit 32, Mich.

Silicone Antifoams

The chemical properties of silicone antifoams and the nature of foaming systems are described in a brochure. Hodag Chemical Corp., 7247 N. Central Park, Chicago 45, Ill.

Paint Bond

How Ospho chemically changes rust to iron phosphate, preparing the surface for regular maintenance paint is described in a folder. The product also serves as a bond between new metal and paint. Rusticide Products Co., 3125 Perkins Ave., Cleveland 14, Ohio.

Material Handling

A complete warehouse handling cycle where speed of the material handling operation was increased by 75 per cent is described in Bulletin 509-1. Dept. R8-19, Lewis-Shepard Products Inc., 125 Walnut St., Watertown, Mass.

Shaping Machines

A brochure covers a universal shaping machine for producing contours, brass electrodes, die sections, and machine components at high speed. Jersey Mfg. Co., 453 Livingston St., Elizabeth 1, N. J.

Clear, Colored Coatings

Informaton on many coatings for various surfaces applied by spraying, screening, and roller coating is provided in a 36-page brochure. Application data are covered for standard and special effects. Bee Chemical Co., 12933 S. Stoney Island Ave., Chicago 33, Ill.

AISI Grades Listed

All AISI grades of cold-finished bars are listed in a comparison chart. Manufacturers' specifications and complete chemical analysis of 241 grades of steel bars are given. Machinability ratings are covered in surface feet per minute or as a percentage rating compared to AISI Grade B1112. La Salle Steel Co., P. O. Box 6800-A, Chicago 80, Ill.

Electrical Coils

A logarithmic conductor slide rule provides a ready means of converting from standard wire sizes in copper or aluminum to an equivalent aluminum strip conductor. Included is cross-sectional area of wire, and weight and electrical resistance of equivalent strip and wire. Aluminum Co. of America, 1501 Alcoa Bldg., Pittsburgh 19, Pa.

Forging Materials

Materials for Hypersonic Weapons describes the forging materials available for aircraft and missile structural parts, classified for various speed and temperature ranges. Charts compare variations of transverse physical properties of high-strength alloy steels. Steel Improvement & Forge Co., 970 E. 64th St., Cleveland 3, Ohio.

Conveyors

Power and free trolley conveyor systems are presented in an 8-page brochure (RSK-1). Conveyor Systems Inc., 6451 Main St., Morton Grove, Ill.

Coil Splicing Equipment

Splice-A-Matic welding equipment for coil splicing is described in Bulletin 43-A. E. W. Bliss Co., 1375 Raff Rd., Canton 10, Ohio.

Motor Control Centers

Bulletin GEA-4979D gives details of industrial motor control centers in NEMA sizes 1 through 6. This equipment is applicable to industries where two or more ac and dc motors can be controlled from a central location. General Electric Co., Schenectady 5, N. Y.

Single-Pan Balances

Balances from microanalytical (with an accuracy of 0.002 milligram) to a large, heavy duty unit for remote control weighing in atomic plants are covered in a bulletin. These units are high speed and direct reading. Fisher Scientific, 420 Fisher Bldg., Pittsburgh 19, Pa.

Digital Instruments

Principles and applications of null balance, digital indicating instruments are set forth in a bulletin (No. 1758). The servodevices are used in measurement of compression, tension, torque, pressure, flow, and temperature. Performance Measurements Co., 15301 W. McNichols, Detroit 35, Mich.

Tool Steel Chart

A brand name comparison chart lists 43 names, and covers the main categories of tool steel. Vulcan-Kidd Steel Div., H. K. Porter Company Inc., Aliquippa, Pa.

Photoelectric Control

Bulletin PA 561 contains specifications, operational charts, and a selector guide for Photoswitch photoelectric systems for industrial control systems. They include counting, sorting, inspecting, precision registration, and high temperature measurement. Photoswitch Div., Electronic Corp. of America, 1 Memorial Dr., Cambridge, Mass.

NEW BOOKS

Conveyor Terms and Definitions, Conveyor Equipment Manufacturers Association, 1 Thomas Circle, Washington 5, D. C. 96 pages, $2

More than 1200 conveyor types, parts, and related equipment are defined in this book. Preferred terms are given and other commonly used terms are related by cross-indexing. The provisions of the recently revised safety code, B20.1-1957, are included with the permission of the American Society of Mechanical Engineers. The expansion and changes in terminology since the first edition in 1952 are particularly noticeable in vibrating and passenger conveyor branches of the industry.

1954-1955 *Bibliographic Survey of Corrosion*, compiled by A. Irene Humphrey, National Association of Corrosion Engineers, 1061 M&M Bldg., Houston 2, Tex. 468 pages, $15 to NACE members, $20 to nonmembers

A selection of 4287 abstracts of articles on corrosion and its prevention published in 1954-55 is presented in this volume. Also included are some published from 1945 to 1953. The material was selected from that gathered by 23 agencies covering international literature.

UNITED

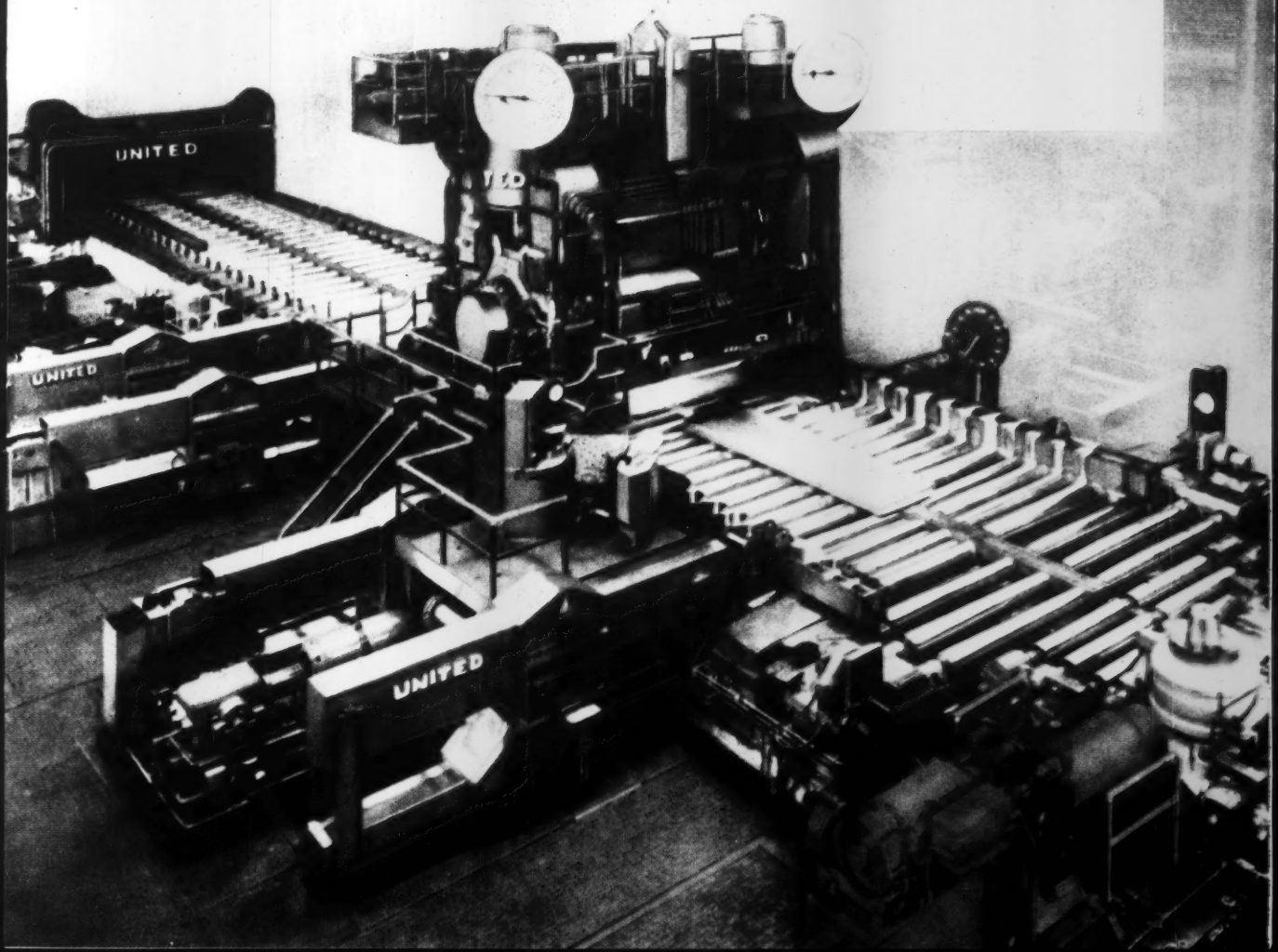
160'' MILL FOR ROLLING ALUMINUM PLATE

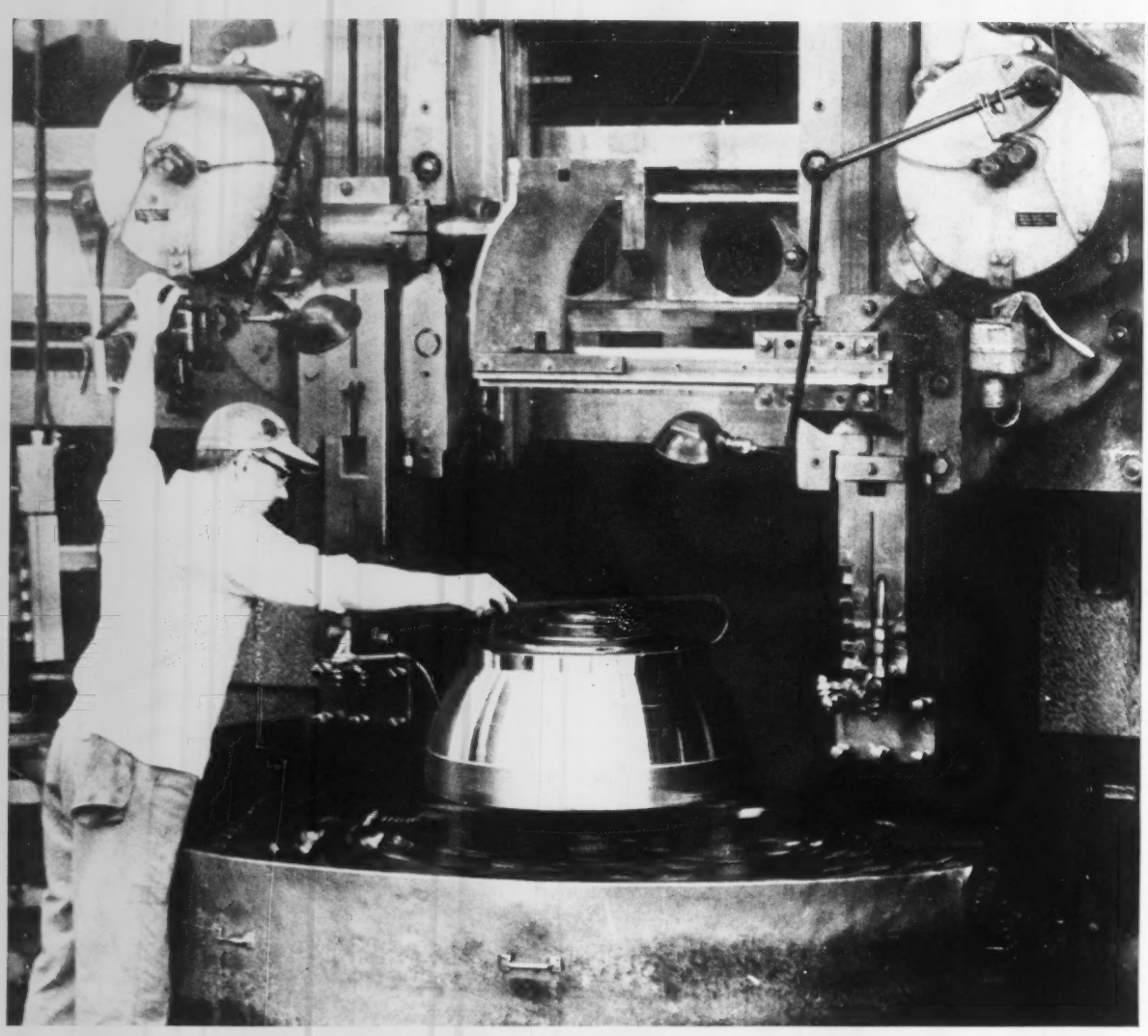
UNITED ENGINEERING AND FOUNDRY COMPANY
PITTSBURGH, PENNSYLVANIA

Plants at Pittsburgh, Vandergrift, Youngstown, Canton, Wilmington

SUBSIDIARIES: Adamson United Company, Akron, Ohio; Stedman Foundry and Machine Co., Inc., Aurora, Indiana

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.





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Man is beginning to conquer outer space. Standard is ready to play its part in this history-making achievement. We think you will find our combination of personalized service and know-how unique in the steel industry. Write Dept. 24.

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BURNHAM, PENNSYLVANIA

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Market Outlook

Auto Sales Hold Key to Recovery

AUTOMAKERS will step up their production schedules during the final weeks of the year, but steelmakers aren't as optimistic as they were a few weeks ago. It appears that the steelmaking rate (now 75 per cent of capacity) is near its 1958 peak.

Car manufacturers committed themselves to a lot of steel before strikes over local issues closed their assembly plants. Steelmakers turned out substantial tonnages of cold-rolled sheets and found that they had no place to ship them. In some cases they shipped to warehouses or other points designated by their customers, but the result was the same: Inventories accumulated. Commercial research men at one company estimate that finished steel stocks increased by 700,000 tons in October alone.

CAR SALES IMPROVE— New car sales averaged 11,740 daily during the first third of November (vs. 9775 daily in the like period of October). Automakers call the trend encouraging, but some had hoped for a 15,000 daily average. They believe sales were hampered by a continuing shortage of new models. The industry is doing its best to fill dealer pipelines. Last week's output (135,000) topped that of the previous week (118,915), thanks to the settlement of the whitecollar strike at Chrysler Corp., but production is still less than it was a year ago.

STEEL SHIPMENTS HOLD— Any increase in automotive requirements, unless it's unexpectedly sharp, will simply offset seasonal declines in construction steel and tin plate. Some mills think the auto strikes will have a good effect in the long run since they've deferred maximum steel demand to a time when it will be needed most. Secondary market support from appliance manufacturers and a long list of small consumers guarantee that November shipments will be as good as last month's.

THEY'LL DROP IN DECEMBER— Although some mills are receiving new automotive orders for December delivery of sheets, industry shipments will probably drop next month. As one steelmaker explained: "This month we'll ship sheets that were held up for two or three weeks, plus our scheduled production. Next month we'll ship only what we can produce." In general, November bookings haven't been as good as October's. Some consumers are cutting their inventories to the bone to minimize yearend tax liability.

STEELMAKING LEVELS OFF— Last week's production was about 2,024,000 net tons of steel for ingots and castings. Furnaces were operated at 75 per cent of capacity, down half a point from the previous week's rate.

CONSTRUCTION RECORD SEEN— Construction, a pillar of strength this year, will furnish even greater support to the steel market in 1959. Studies prepared by the Departments of Commerce and Labor indicate that $52.3 billion will be spent for new construction next year (vs. $48.8 billion in 1958). The increases will be mostly in residential building (public and private) and highways. Thomas F. Patton, president of Republic Steel Corp., estimates that construction will take 10.5 million tons of steel this year and about 12.2 million tons in 1959.

SERVICE CENTERS GAIN— Although their shipments for all of 1958 will probably be 25 or 30 per cent below last year's, steel service centers are having a better fourth quarter than they had in 1957. Cold-rolled and galvanized sheets are tight; plates are gaining; and structurals are still in the doldrums.

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*Current prices were published in the Nov. 17 issue and will appear in subsequent issues.

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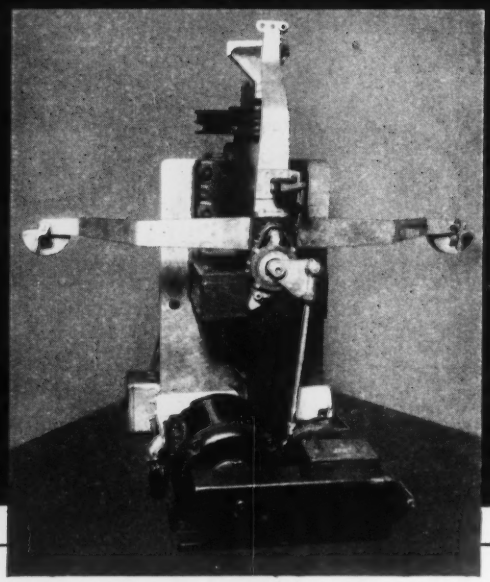

Here at Cleveland, we feel that a buyer of metallic abrasives should be able to do just that.

The breakdown tester we use is shown herewith, and it's designed to separate the fact from the fiction.

After 100 passes through this tester, at 7200 r.p.m., we *know* how good our abrasives are and how long they will last.

This tester, combined with our other extensive laboratory equipment, is an integral part of our production control system.

All of it, of course, is working hard every day to give you top-quality, long-life, economical Metallic Abrasives . . . based on fact.

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COMPARATIVE TEST REPORT

MATERIAL TESTED — S660 CHILLED IRON SHOT

A - Cleveland Metal Abrasive B - Competitors C - Competitors

SCREEN ANALYSIS

U.S. No.	S.A.E. Spec.	A	B	C
8	0	0	0	0
10		33.5	54.0	36.0
12	85	60.3	36.2	48.0
14	12	4.2	7.7	14.0
Pan	3	0	1.1	2.0

CHEMICAL ANALYSIS

	A	B	C
T.C.	2.72	3.29	2.42
Si	1.13	1.36	1.20
Ph	.056	.380	.130
Mn	.40	.36	.47
S	.128	.176	.141

Rc HARDNESS

	A	B	C
Low	58	59	57
High	62	65	62
Average	60	63	59

BREAKDOWN TEST

Thru U.S. No. 10 on U.S. No. 12 — No. of Grams Tested—100 — 100 Passes at 7200 R.P.M.

	A	B	C
12	0	0	0
14	2	0	.1
16	4	0	.5
18	4.8	.1	3.5
20	15.6	.2	9.4
25	34.4	7.9	20.7
30	13.5	8.4	12.1
35	9.9	10.6	11.5
40	4.3	11.3	6.0
45	2.7	7.1	4.6
50	2.0	14.2	3.4
Pan	13.7	27.6	17.8
Loss	8.7	12.6	10.4

Remarks — C.M.A. material best by test. *B. M.*

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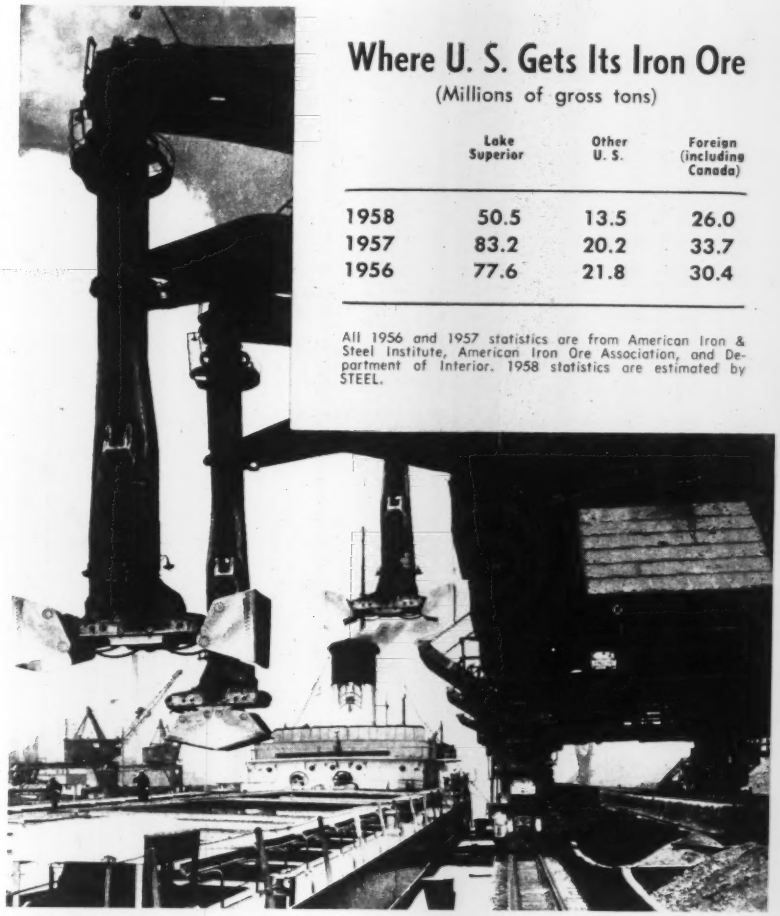

Bethlehem Steel Co.

Where U. S. Gets Its Iron Ore

(Millions of gross tons)

	Lake Superior	Other U. S.	Foreign (including Canada)
1958	50.5	13.5	26.0
1957	83.2	20.2	33.7
1956	77.6	21.8	30.4

All 1956 and 1957 statistics are from American Iron & Steel Institute, American Iron Ore Association, and Department of Interior. 1958 statistics are estimated by STEEL.

Accent Is on Quality Ores

Beneficiation and the purchase of foreign ores gain as steel producers strive for greater efficiency. Stocks are adequate for winter. Shipping season ends early

THE TREND to treated ores, accelerated by steelmen's demands for high quality ore of uniform size, is continuing. Over 88 per cent (104.1 million gross tons) of domestic and Canadian iron ore shipped to U. S. steelmakers last year was beneficiated (including screening and crushing).

Reason: High quality ores increase productivity without expansion of facilities.

"Emphasis has shifted from the cost of ore to the cost of iron in the ladle," says an operations vice president.

• **Future**—Steel firms have not decided what their ore specifications should be. Many consider pellets and self-fluxing sinter best. A leading ore company executive said the future will be decided when steel companies know what they want. After the decision, which is "imminent," six to seven years will be needed to fulfill demands.

Other men in the industry agree that all Lake Superior ores and most other ores will be beneficiated in some way within two to ten years, with a large increase in concentrated ores. Of the beneficiated domestic ores shipped last year, 41.8 million gross tons (49 per cent) were treated by means other than screening or crushing.

• **Concentrated Ores** — Concentration permits the upgrading of low grade taconite and jasper from 30 per cent to 60 per cent iron, with the added benefit of ideal structure (uniform pellets).

Lean ores with 40 per cent iron can be beneficiated to 50 per cent iron by washing, jigging, and heavy density and gravity separation, but ideal structure is not attained. Because these ores are not economically practical to concentrate, the demand for them will decline until they can be made to meet the new iron ore requirements, states one official.

• **Imports**—Foreign ores, primarily from Canada and Venezuela, are still snagging a large share of U. S. steel purchases. Reasons: 1. Imported ores are of high quality. 2. Our iron ore production is insufficient to supply the iron and steel industry at capacity for a sustained period. The conservation of domestic ores by supplementing them with imports is necessary.

An ore company spokesman states: "We can ship Venezuelan ore to Pittsburgh as cheaply as Minnesota ore."

• **Current Stocks** — Although ore shipments on the Great Lakes are about 33 million gross tons below last year's, iron and steel executives interviewed by STEEL all reported adequate stocks on hand to carry them through the winter. No rail shipments are anticipated, and most ships on the lakes will lay up earlier than usual this year.

Earlier this fall, it was anticipated that the shipping season would end the earliest since 1944. (The last ship was loaded on Nov. 20.) Owing to the slack period this year, many ships were not even in service.

But a late upturn in steel mill requirements will keep a few ships

out until the end of the month. Pittsburgh Steamship Div., U. S. Steel Corp., Cleveland, has announced its last ship won't lay up until Nov. 28. It has 16 vessels in operation, six more than expected. Another shipper planned to lay up between Nov. 20 and the end of the month, a week later than previously announced.

Pig Iron . . .

Pig Iron Prices, Page 150

Merchant iron demand lags. This is due to light consumption and lack of interest in stocks.

Shipments to gray iron and malleable shops in New England are slightly heavier. Melt schedules are up 10 to 15 points at most jobbing shops except those supplying machine tool castings.

Chicago district activity is above average. Iron sellers are delivering at the best rate since late 1957 and some suppliers think December business will be as large as that currently. Automotive foundries are increasing production schedules. Foundries which supply Caterpillar Tractor Co. are hurt by a strike at that company's plants.

With the end of the lake navigation season near, westward movement of iron from Buffalo by water will be ending. This movement has been much lighter than a year ago. Likewise, movement of merchant iron from Buffalo east on the Barge Canal is down sharply from last year.

Offerings of foreign pig iron continue at prices well under the domestic market.

Shenango Furnace Co., Sharpsville, Pa., has blown in its second blast furnace to furnish more iron for the adjacent Shenango-Penn Mold Co. Youngstown Sheet & Tube Co. blew in its No. 4 furnace at the Campbell Works and blew out the No. 2 furnace for a relining job.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 146 & 147

Except for specialties, sheet producers can work in tonnage for delivery before yearend. Hot-rolled sheets are available within two to four weeks, cold rolled in five to six. Relatively little change is reported in shipment promises over the last few weeks, but demand has been gradually gaining.

In some sheet specialties, the situation has become so tight the mills are beginning to ration tonnage, selling on a quota basis. That is true on some of the coated specialties, with the mills sold up through January. Sellers of enameling stock and silicon sheets can work in a little tonnage before yearend, but their order books for January shipment are filling up. Galvanized sheets are booked well into first quarter, some mills being unable to take additional tonnage before February.

Automotive releases are being received at a better rate. December delivery orders are being booked steadily. That's close leadtime, but most sheetmakers can accommodate the tonnage.

"Our shipments (sheets) will be as good this month as they were in October, and as good next month as they are now," a Pittsburgh mill reports. "There hasn't been much change in automotive demand. We're getting releases that were held up when strikes closed assembly

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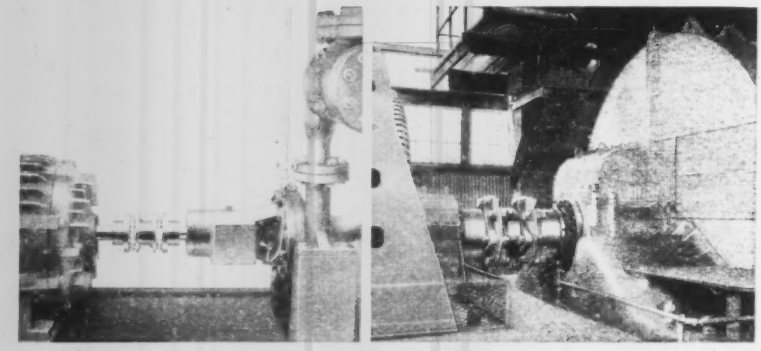

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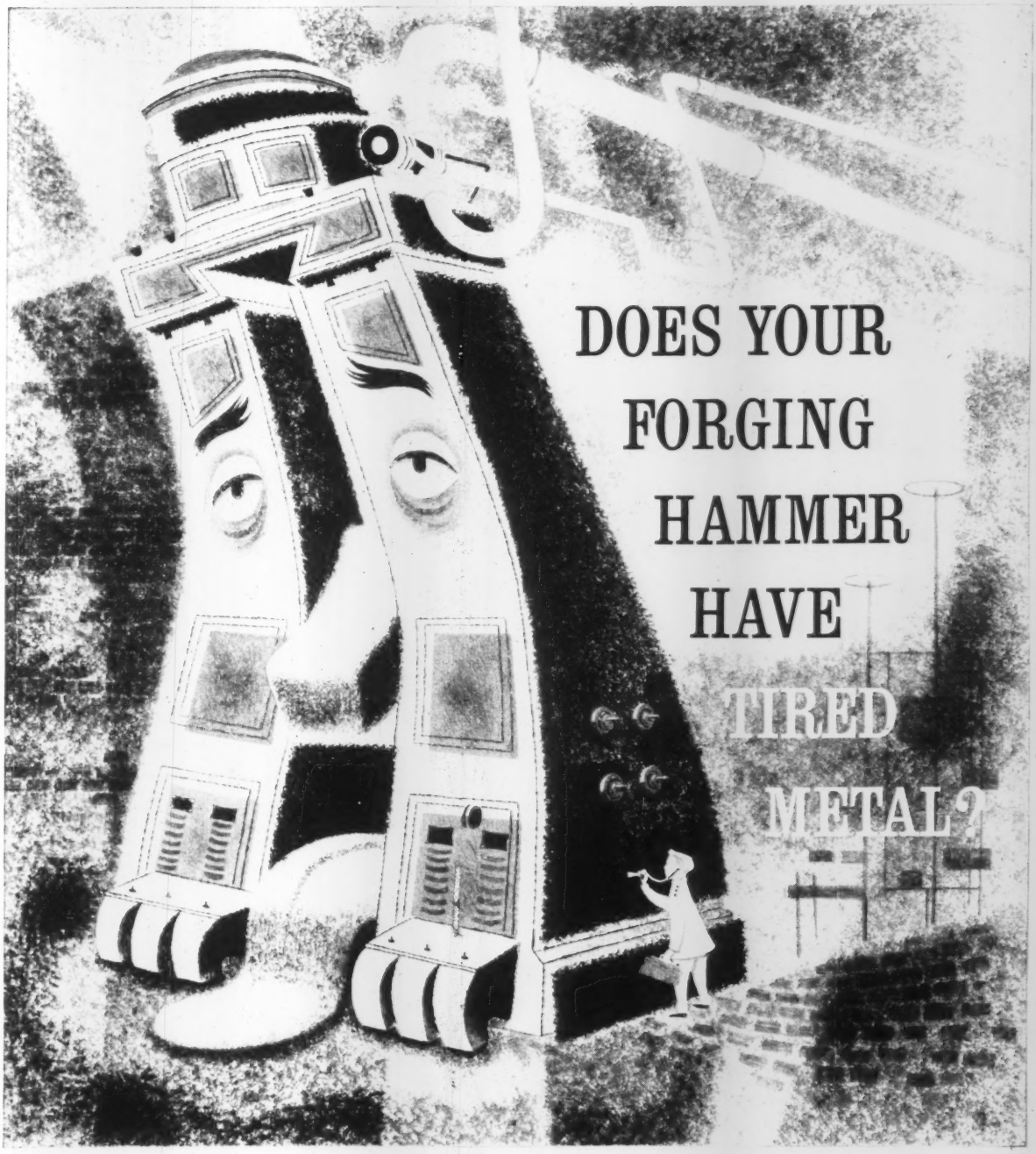

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plants, but it's too early to tell whether new car sales will be good enough to justify additional sheet orders.

"Furniture makers are taking bigger tonnages, and it looks like the appliance market will be active through January. We're promising deliveries in three weeks on hot-rolled sheets, and four to five weeks on cold rolled."

Orders are being placed for January shipment in New England. That represents forward buying in a technical sense, but most current ordering is still for relatively nearby delivery. Nothing big in the way of inventory building is expected before the first half of 1959, when the threat of a midyear steel strike is likely to drive considerable hedge tonnage onto mill books.

Steel Bars . . .

Bar Prices, Page 145

Moderate, but steady improvement in demand for hot and cold drawn carbon bars continues. Buying is more diversified, and there's some ordering for inventory. The pickup in automotive business is having a tightening effect on shipments, though delivery promises still range two to four weeks.

Pittsburgh district mills shipped more hot-rolled bars in October than in any previous month this year, despite automotive labor troubles. Shipments in some cases were up 25 to 30 per cent over September's. November tonnage is thought likely to equal November's, and a slight increase is anticipated next month.

Cold finishers are encouraged by the way new business has been coming in. They're operating below 75 per cent of capacity, but they're engaged at the best rate so far this year, and indications are the November rate will hold into December. One mill booked more business in September than in any month since 1956.

Plates . . .

Plate Prices, Page 145

Platemakers are hopeful of a pickup in orders in January. Current business is off a trifle, but a little more tonnage appears moving to warehouses and fabricators of fuel oil tanks.

Inquiry is spotty, with requirements for industrial water tanks scarcely holding at recent level, and, in the case of municipal work, slumping noticeably. Building needs are down seasonally.

A Pittsburgh mill expects its November shipments to exceed October's by 10 per cent. A sales official said: "With any luck, November could be our best month."

Railroad buying continues sluggish, but ship needs are fairly active. Slack demand for capital goods is retarding demand for weldments, forgings, and flanged shapes. Small tank volume is off, and built-up plate girder bridge contracts are slow.

Major new shipwork includes seven missile frigates for the Navy costing $182,493,105. Three of the ships went to the Bath Iron Works, Bath, Maine; two to the New York Shipbuilding Corp., Camden, N. J.; and one each to the Puget Sound Bridge & Dredging Co., Seattle, and Todd Shipyards Corp., Los Angeles Div., San Pedro, Calif. The Navy closes bids Dec. 10 on 37 landing craft (LCP-L).

SR . . . the dc rectifier type welder with new completely sealed semimetallic rectifier, new transformer and new weld stabilized circuit. Result is easiest arc starting ever; maximum arc stability; sounder, denser welds; current that handles all electrodes in all positions! Four models, 200 to 600 amps.

SRH . . . the same revolutionary improvements that set the Gold Star SR above and beyond the performance standards ever before achieved by a dc rectifier type welder. Designed primarily for compactness, the SRH is only 30¼" high — is ideally suited for stacking or paralleling in minimum space. Three models, 200 to 400 amps.

300 . . . combination ac/dc welder design comes of age with this new Miller model. Features: new magnetic amplifier circuit; improved wave form; new arc starting control; three electrically controlled current ranges for finest adjustment; instant changeover from ac to dc; built-in high frequency. An entirely fresh concept for inert gas and metallic welding. Four basic models with kits available to convert to seven different types of welders.

300-M . . . an ac welder for inert gas and metallic arc processes. Combines unequalled welding characteristics with Miller's unique electric control circuit which permits precise slow or fast start. Features: built-in high frequency, primary contactor and ½ KVA control transformer. Offered in three basic models of from 200 to 400 amperes with optional water and gas controls available.

Complete particulars on any of the above welders will be sent promptly.

miller ELECTRIC MANUFACTURING COMPANY, INC. Appleton, Wisconsin

Distributed in Canada by Canadian Liquid Air Co., Ltd., Montreal, P. Q.

Plate deliveries still range two to three weeks on sheared, universal, and strip-plate. In a few instances, even earlier shipments are available.

Wire . . .

Wire Prices, Pages 147 & 148

January delivery orders for high-carbon spring wire, manufacturers' wire, and automotive spring wire (including valve springs and upholstery coils) are heavier. December shipment tonnage is somewhat below the October-November level.

Buying for the first quarter appears to be on a somewhat broader base than it has been lately, but still there's no sign a substantial inventory buildup is in the works.

Imported material continues to bother domestic manufacturers. On the West Coast, common nails from Japan are moving at about $2 per 100 lb under the domestic product.

U. S. Steel Export Co., New York, subsidiary of U. S. Steel, has advanced its export base price on galvanized plain wire to $9.79 per 100 lb, reflecting recent increases in zinc prices.

Tubular Goods . . .

Tubular Goods Prices, Page 149

Maintenance work is providing a fair demand for buttweld pipe, heating installations giving the market a needed nudge. In general, though, demand is sluggish, and seasonal slackening in construction will affect shipments adversely.

Producers are increasingly disturbed by growing competition from foreign makers. Imported pipe is underselling the domestic product in home markets by as much as 18 per cent. Also, U. S. producers are losing business to European makers in the export market. Recently, it's reported, a German pipemaker booked a 1-million-ton pipeline in Argentina, underbidding U. S. exporters by $20 to $25 a ton.

Pipemakers still are hoping for a decision by the U. S. Supreme Court in the Memphis Case before yearend. It's estimated close to $1 billion in pipeline work has been delayed since late last year by the ruling of the U. S. Circuit Court of Appeals.

That decision held the Federal Power Commission could not accept rate increase pleas based on Sec. 4 of the Natural Gas Act unless all customers of a pipeline agreed to a hike in advance. Lacking such approval, rate increases would have to be dealt with under the slower procedure of Sec. 5 of the act. Pipeline people say this would make it impossible for them to catch up with rising costs.

In the event the Supreme Court affirms the lower court's ruling, it's expected the FPC will seek a new way to speed action on rate hikes. Whether a ruling favoring the pipeline companies would quickly stimulate expansion of pipelines is not certain. It's thought some jobs would be pushed once the threat of compulsion to refund huge sums was removed. Recently, several transmission companies negotiated new rate agreements; in some cases, as many as 100 customers were involved.

Reflecting recent increases in zinc prices, the U. S. Steel Export Co.,

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For dependable performance, electric typewriters require hard, tough, perfectly flat type-bars. One manufacturer, using conventional heating equipment, achieved hardness and toughness, but the flatness left something to be desired.

Selas designed and built a heat processing machine to produce hard, tough, *perfectly flat* type-bars, at production rates of 5000 per hr.

Former equipment included two open salt baths, hazardous even in day-to-day operation; particularly dangerous during the monthly clean-out of carry-over sludge.

The Selas equipment uses a single covered salt bath which has completely removed both of these hazards.

The following 15 economic factors prove that this manufacturer's investment in Selas continuous heat processing equipment yielded immediate returns in reduced costs, increased production and improved product quality:

Material Saving

Selas direct heating eliminates the high temperature salt bath thus preventing contamination of the salt quench. Salt savings have been estimated by Selas engineers to amount to $25,000 per year.

Labor Requirements

Three men do the work previously performed by five . . . a labor saving of 40%. In a continuous 2-shift operation, annual savings can amount to as much as 26% of the original equipment cost. These savings might very well be doubled by fully-automatic loading now being developed.

Automatic Operation

Type-bars are conveyed automatically through the high temperature Gradiation furnace, the salt quench, the washer and the dryer.

Material Handling

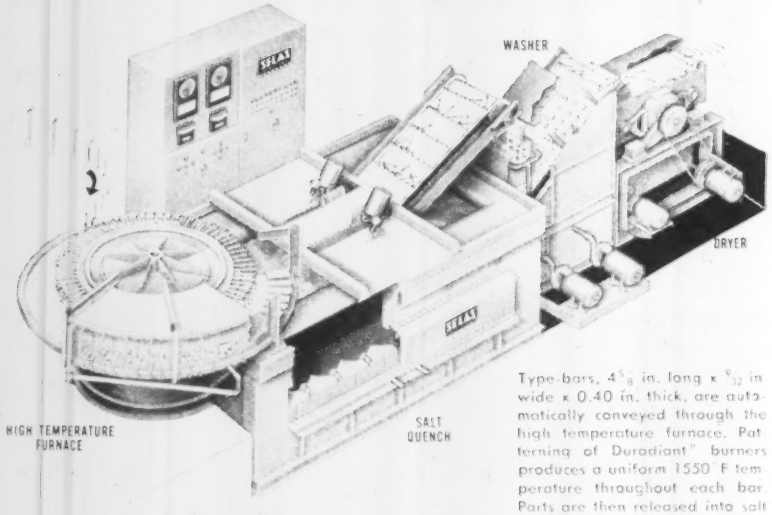
The compactness and simplicity of the Selas unit have eliminated the need for dip-type fixtures. Instead of being transported through the plant to a separate heat treating department, parts are loaded from the adjacent stamping press to pass automatically through the several processes embodied in this one Selas machine —and are delivered for final tumbling and plating at the discharge end of the unit.

Maintenance

Because racks and extra fixtures are not required and salt pot cleaning is reduced to a safe, routine operation, maintenance costs are substantially less.

Human Element

Custom-built precision and automatic operation avoid variations due to human handling. Top production of uniformly austempered type-bars is consistently achieved.



Type-bars, $4\frac{5}{8}$ in. long x $\frac{5}{32}$ in. wide x 0.40 in. thick, are automatically conveyed through the high temperature furnace. Patterning of Duradiant™ burners produces a uniform 1550 F temperature throughout each bar. Parts are then released into salt bath which is held at 680 F by Gradiation™ heating.

Product Quality

Type-bars austempered in this machine meet specification for flatness of 0.001 in. and for hardness of Rc 42-44.

Temperature Control

Furnace temperature, salt quench temperature and dryer temperature are automatically controlled from the convenient cubicle supplied by Selas.

Work in Process

Previous batch method consumed hours. This Selas continuous heat processing equipment heats conveyorized type-bars in 25 seconds, holds them in the salt bath for 15 minutes, cleans and dries them . . . a total of 21 minutes for the entire, complex austempering process.

Product Value

Value of the product as it is passing through this machine in a few hundred hours equals the customer's entire investment in the Selas custom-built equipment.

Fuel Efficiency

Fuel cost amounts to about 1 hour of the 320 hour monthly production.

Production Requirements

The Selas machine is capable of uniformly austempering 5,000 type-bars per hour.

Flexibility

Any of a number of similar metal stampings can be processed in this versatile machine. The customer has since purchased a second Selas machine to austemper cam levers at production runs of 6,000 per hour, as well as type-bars.

Process Coordination

The Selas machine, developed cooperatively by the customer's and Selas' engineers, was designed to fit into the production area, completely integrated with the normal production schedule of the electric typewriter manufacturer. All equipment, including panel-mounted combustion and temperature controls, was built at Selas. Selas engineers supervised start-up in customer's plant.

Floor Space

The compact unit occupies about half the floor space occupied by previous equipment. With all the heat directed into the workpieces—not the work area —adjacent floor space can be utilized efficiently.

* * *

For further information on this installation, send for reprint "Automatic and in the Line." For case histories covering other heat treating operations, heating for hot working, and brazing, send for reprint "An Economic Appraisal of Continuous Heat Processing." Address Dept. 211, Selas Corporation of America, Dresher, Pa.

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Heat and Fluid Processing Engineers

DEVELOPMENT • DESIGN • CONSTRUCTION

New York, subsidiary of U. S. Steel Corp. has revised its discounts on American standard pipe: Buttweld, galvanized, 2½ and 3 in., plus 6.9 per cent; 3½ and 4 in., plus 17.9 per cent; seamless, galvanized, 2 in., plus 33.85 per cent; 2½ in., plus 28.60 per cent; 3 in., plus 26.10 per cent; 3½ and 4 in., plus 24.60 per cent; 5 in., plus 23.15 per cent; 6 in., plus 20.65 per cent.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 151

Inland Steel Co. began charging the new No. 9 coke oven battery at its Indiana Harbor (Ind.) Works Nov. 4. The battery (87 ovens) will produce 1200 tons daily when it reaches capacity early next month, making the works self-sustaining on its coke needs.

No. 9 battery is the third to go into production at this plant in just over two years. It replaces No. 5 battery which was dismantled. The new battery is a twin to No. 8 which was started up March 18.

The works now has seven batteries of ovens.

Structural Shapes . . .

Structural Shape Prices, Page 145

Some sizable jobs are on drawing boards, but inquiry is off seasonally, and orders are spotty. Publicwork, especially bridge construction, provides chief support to the market at most centers.

Fabricators' backlogs are slipping steadily. Most shops are anticipating little in the way of an upturn in business before February. Competition is increasingly sharp.

The market is not without some promising spots. At Pittsburgh, a district mill reports that despite the absence of a railroad carbuilding program, standard structurals are in "rather good shape." Bookings are reported close to those of the best previous month this year. Demand for wide flange beams isn't as strong as it was in May and June, but November entries will be nearly as good as they were early in the summer.

Shape deliveries range two to four weeks, both for standard and wide flange sections.

A large structural mill being built by Blaw-Knox Co., Pittsburgh, for the South Chicago Works, U. S. Steel Corp. is nearing completion. The mill will add finishing capacity to U. S. Steel's Chicago district operations, producing a variety of standard structural products, wide flanged beams, piling bars, and semifinished billets.

Rolling equipment includes one 40 in. by 90 in. two-high reversing breakdown blooming mill; four 34 in. by 80 in. two-high mill stands; and four universal beam stands with edging mills, along with tables, transfers, saws, and other auxiliary equipment.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

700 tons, state bridgework, Roosevelt Boulevard extension, Philadelphia, through Lipsette Inc., general contractor, to Harris Structural Steel Co., New York.

375 tons, state bridge, Dock St., Harrisburg, Pa., through Berlanti Construction Co., Harrison, N. J., general contractor, to Harris Structural Steel Co., New York.

240 tons, state bypass, Reading, Pa., to High Welding Co., Lancaster, Pa.

STRUCTURAL STEEL PENDING

1416 tons, state bridgework, Susquehanna County, Pennsylvania; bids Dec. 5; also, 424 tons of reinforcing steel required.

690 tons, highway bridge, Thompson Falls, Mont.; general contract to Peter Kiewit Sons Co., Billings, Mont., low at $564,981.

370 tons, Hood Canal bridge approaches, Washington State; bids to Olympia, Wash., Dec. 2.

185 tons, overcrossing, Auburn, Wash.; bids to Olympia, Wash., Dec. 2.

REINFORCING BARS . . .

REINFORCING BARS PLACED

500 tons, including structurals, Tower office building, Bennert Corp., Norfolk, Va., to Hall-Hodges Co., Norfolk, and Reading Steel Products Co., Reading, Pa. (structurals); Gilbane Building Corp., Providence, R.I., is general contractor.

75 tons, addition to hospital, Everett, Wash., to unstated interest; Cawdrey & Vemo, Seattle, general contractor.

REINFORCING BARS PENDING

424 tons, state bridgework, Susquehanna County, Pennsylvania, bids Dec. 5; also, 1416 tons of structurals required.

320 tons, also 35 tons of shapes, Spokane Street ramps and overpass, Seattle, a Washington State highway project; general contract to Alton V. Phillips Co., Seattle, low at $550,623.

255 tons, overcrossing at Auburn, Wash.; bids to Olympia, Wash., Dec. 2.

135 tons, also unstated tonnage of piling, Hood Canal bridge approaches, Washington State; bids to Olympia, Wash., Dec. 2.

Semifinished Steel . . .

Semifinished Prices, Page 145

Steelmaking operations slipped 0.5 last week to 75 per cent of capacity. In some producing centers, the feeling prevails that production may have peaked out for this year, and that the next upswing won't come until early 1959.

Some companies are engaged at the best rates of the year. Granite

How do you measure the real cost of your heat processing?

A continuous furnace is more than just a brick-lined structure built to heat a material; it is a processing tool.

Like all processing tools, it must be evaluated on an overall basis. Fuel consumption and efficiency may be completely outweighed by many more-important economic factors encompassing your workpiece, your total production program, and your work force.

Your evaluation may well prove that an investment *now* in Selas continuous heat processing will bring immediate returns in reduced costs and improved product quality. (See case history describing heat treatment of electric typewriter type-bars on facing page).

SELAS

City Steel Co., Granite City, Ill., for example, has been operating all its seven open hearths the last three weeks. Its order backlog is up about 30 per cent over last summer's.

A 30 by 79 by 80 in. ingot, weighing more than 20 tons and the biggest in Inland Steel Co.'s history, started production of 75 in. wide slabs early in November, and opened the way to first time, straight-away rolling in the 76-in. hot strip mill to turn out 72 in. wide strip.

The wider slabs from the giant ingots will mean increased productivity and cost reduction down the line to cold strip. Maximum 72 in. wide, cold rolled strip will continue to prevail, but the strip can be rolled more efficiently. Previously, to get a 72 in. wide product from a narrower slab at the 76-in. hot strip mill, crossrolling was necessary.

Blaw-Knox Co., Pittsburgh, has completed a large universal slabbing mill and auxiliary equipment for the Gary (Ind.) Steel Works, U. S. Steel Corp. The equipment includes a 46 by 90 in. horizontal mill, with a 38 by 84 in. vertical edging mill. It's expected the new facility will begin operation before yearend.

October Steel Production Is Largest in Year

Production of steel during October totaled 8,816,000 net tons, reports the American Iron & Steel Institute. It was the largest monthly output since October, 1957, and the first 8-million-ton month this year.

The total bettered that in September by 1.2 million tons. In October, 1957, output was 9,197,717.

Output in the first ten months of this year was 67,885,267 tons, off 29,016,525 from the 96,901,792 tons poured in the like 1957 period.

In October, the institute's index of steelmaking was 123.9 in terms of the basic index of average production during 1947-49. In September it stood at 110.5; in October last year it was 129.3. The figure for the first ten months of this year was 97.3, against 138.9 in the comparable 1957 period.

Based on Jan. 1, 1958, steelmaking capacity (140,742,570 net tons annually), ingot operations averaged 73.8 per cent in October, vs. 65.8 in September. Operations averaged 57.9 in the first ten months.

Steel Ingot Production—October, 1958

Period	OPEN HEARTH Net tons	OPEN HEARTH Per cent of capacity	BESSEMER Net tons	BESSEMER Per cent of capacity	ELECTRIC Net tons	ELECTRIC Per cent of capacity	TOTAL Net tons	TOTAL Per cent of capacity
1958								
January	6,085,124	58.6	121,338	35.5	547,440	44.8	6,753,902	56.5
February	5,252,112	56.0	81,597	26.4	448,614	40.6	5,782,323	53.6
March	5,598,944	53.9	122,317	35.8	533,361	43.6	6,254,622	52.3
1st Qtr.	16,936,180	56.2	325,252	32.8	1,529,425	43.1	18,790,857	54.1
April	4,875,619	48.5	109,433	33.1	547,939	46.3	5,532,991	47.8
May	5,602,123	53.9	110,366	32.3	588,670	48.2	6,301,159	52.7
June	6,378,942	63.4	88,125	26.6	666,413	55.8	7,127,480	61.6
2nd Qtr.	16,856,684	55.3	307,924	30.7	1,797,022	50.1	18,961,630	54.0
1st 6 Mo.	33,792,864	55.7	633,176	31.7	3,326,447	46.6	37,752,487	54.1
July	5,712,587	55.0	114,218	33.4	593,600	48.6	6,420,405	53.7
August	6,481,185	62.4	134,435	39.3	670,383	54.8	7,286,003	61.0
*September	6,769,660	67.3	103,194	31.2	737,518	62.3	7,610,372	65.8
*3rd Qtr.	18,963,432	61.5	351,847	34.7	2,001,501	55.2	21,316,780	60.1
*9 Mo.	52,756,296	57.7	985,023	32.7	5,327,948	49.5	59,069,267	56.1
*October	7,795,000	75.0	148,000	43.3	873,000	71.4	8,816,000	73.8
1957								
January	9,529,691	99.0	294,839	77.1	884,232	86.5	11,008,762	97.1
February	8,508,671	99.2	227,682	80.4*	810,583	87.8	9,987,206	97.6
March	9,442,164	95.1	275,156	71.9	871,754	85.2	10,589,074	93.4
1st Qtr.	28,170,526	97.7	847,677	76.3	2,566,539	86.4	31,585,042	96.0
April	8,820,328	91.8	231,731	62.6	762,721	77.1	9,814,780	89.5
May	8,842,707	89.1	201,564	52.8	747,752	73.1	9,792,323	86.4
June	8,498,903	88.4	210,915	57.0	681,584	68.9	9,391,402	85.6
2nd Qtr.	26,161,938	89.8	644,510	57.4	3,192,057	73.0	28,998,505	87.2
1st 6 Mo.	54,332,464	93.7	1,492,187	66.8	5,758,596	79.7	60,583,547	91.5
July	8,086,519	84.1	194,638	50.9	627,575	61.4	8,908,732	78.6
August	8,297,172	83.6	204,723	53.5	731,995	71.6	9,233,890	81.5
September	8,135,139	84.7	185,967	50.2	656,800	66.4	8,977,906	81.8
3rd Qtr.	24,518,830	83.2	585,328	51.5	2,016,370	66.4	27,120,528	80.6
9 Mo.	78,851,294	90.2	2,077,515	61.7	6,775,266	75.2	87,704,075	87.9
October	8,318,522	84.1	154,577	40.4	694,618	67.9	9,197,717	84.1
November	7,674,698	79.9	134,709	36.4	583,512	59.0	8,392,919	76.5
December	6,783,262	68.3	108,237	28.3	528,686	51.7	7,420,285	65.5
4th Qtr.	22,806,482	77.4	397,623	35.0	1,806,816	59.5	25,010,921	74.4
2nd 6 Mo.	47,325,312	80.3	982,951	43.3	3,823,186	63.0	52,131,449	77.5
Total	101,657,776	87.0	2,475,138	54.9	8,582,082	71.3	112,714,996	84.5

Note—The percentages are based on annual capacities as of Jan. 1, 1958: Open hearth, 122,321,830 net tons; bessemer, 4,027,000 net tons; oxygen process, electric, and crucible, 14,398,740 net tons. Total: 140,742,570 net tons. In 1957, the capacity tonnages were: Open hearth, 116,912,410 net tons; bessemer, 4,505,000 net tons; oxygen process, electric, and crucible, 12,041,740 net tons. Total, 1957: 133,459,150 net tons.

*Revised. Preliminary.

DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

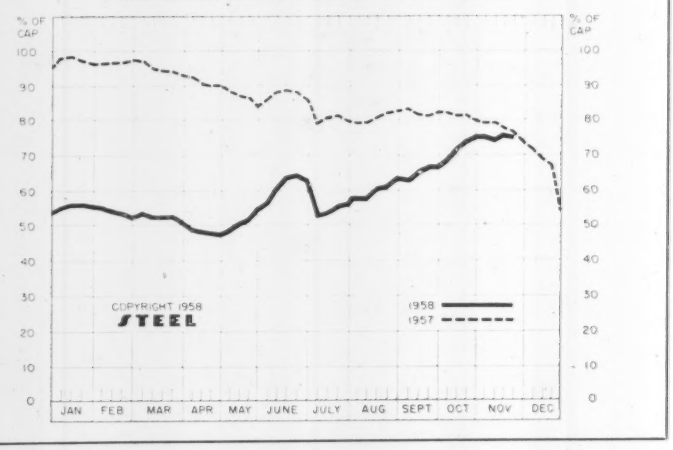
	Week Ended Nov. 23	Change	Same Week 1957	Same Week 1956
Pittsburgh	68.5	— 1.5*	80	96
Chicago	84.5	— 1.5*	77.5	100
Eastern	71	— 1	82.5	102
Youngstown	61	— 1	70	104
Wheeling	85	+ 0.5	64	102.5
Cleveland	71	+ 2	71.5	104
Buffalo	78	0	83	107.5
Birmingham	58	+ 1.5	60.5	95.5
Cincinnati	83	— 3	86	96
St. Louis	86	+ 1.5*	89	100
Detroit	101.5	+ 5*	92	101
Western	78	0	86	107
National Rate	75	— 0.5	76.5	100.5

INGOT PRODUCTION‡

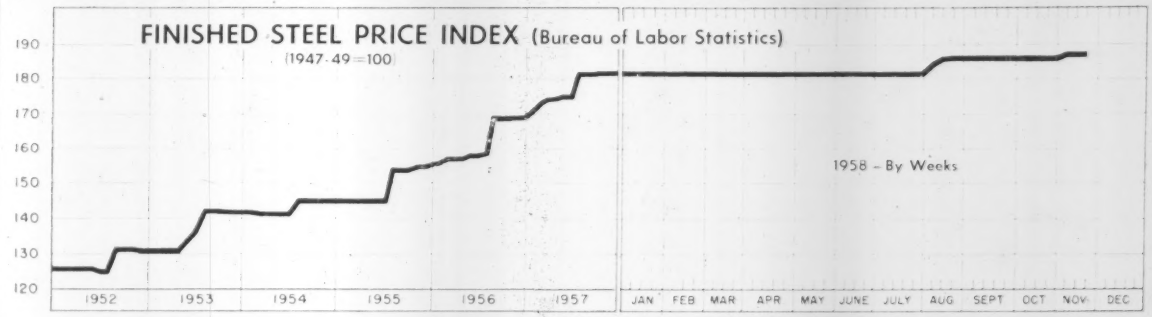
	Week Ended Nov. 23	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	124.8†	125.2	126.1	121.1
NET TONS (In thousands)	2,005†	2,011	2,026	1,945

*Change from preceding week's revised rate. †Estimated. ‡American Iron & Steel Institute. Weekly capacity (net tons): 2,699,173 in 1958; 2,559,490 in 1957; 2,461,893 in 1956.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



Nov. 18, 1958	Week Ago	Month Ago	Nov. Avg	Year Ago
187.4	187.4	186.7	187.4	181.7

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Nov. 18

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.825	Bars, Reinforcing	6.385
Rails, Light, 40 lb	7.292	Bars, C.F., Carbon	10.710
Tie Plates	6.875	Bars, C.F., Alloy	14.125
Axles, Railway	10.175	Bars, C.F., Stainless, 302 (lb)	0.553
Wheels, Freight Car, 33 in. (per wheel)	62.000	Sheets, H.R., Carbon	6.350
Plates, Carbon	6.350	Sheets, C.R., Carbon	7.300
Structural Shapes	6.167	Sheets, Galvanized	8.689
Bars, Tool Steel, Carbon (lb)	0.560	Sheets, C.R., Stainless, 302 (lb)	0.688
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.680	Sheets, Electrical	12.625
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.400	Strip, C.R., Carbon	9.489
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.895	Strip, C.R., Stainless, 430 (lb)	0.493
Bars, H.R., Alloy	10.775	Strip, H.R., Carbon	6.250
Bars, H.R., Stainless, 303 (lb)	0.525	Pipe, Black, Buttweld (100 ft)	20.525
Bars, H.R., Carbon	6.675	Pipe, Galv., Buttweld (100 ft)	24.315
		Pipe, Line (100 ft)	205.710
		Casing, Oil Well, Carbon (100 ft)	201.080
		Casing, Oil Well, Alloy (100 ft)	315.213
		Tubes, Boiler (100 ft)	51.200
		Tubing, Mechanical, Carbon (100 ft)	26.157
		Tubing, Mechanical, Stainless, 304 (100 ft)	205.608
		Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	10.100
		Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.800
		Black Plate, Canmaking Quality (95 lb base box)	7.900
		Wire, Drawn, Carbon	10.575
		Wire, Drawn, Stainless, 430 (lb)	0.653
		Bale Ties (bundles)	7.967
		Nails, Wire, 8d Common	9.828
		Wire, Barbed (80-rod spool)	8.719
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	Nov. 19 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	247.82	247.82	246.65	239.15	189.38
Index in cents per lb	6.713	6.713	6.682	6.479	5.130

STEEL's ARITHMETICAL PRICE COMPOSITES*

Finished Steel, NT	$149.96	$149.96	$149.28	$146.03	$115.18
No. 2 Fdry Pig Iron, GT	66.49	66.49	66.49	66.49	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	56.04
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	57.27
Steelmaking Scrap, GT	40.67	42.33	42.33	33.17	35.00

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL

	Nov. 19 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.675	5.675	5.675	5.425	4.15
Bars, H.R., Chicago	5.675	5.675	5.675	5.425	4.15
Bars, H.R., deld Philadelphia	5.975	5.975	5.975	5.725	5.302
Bars, C.F., Pittsburgh	7.65*	7.65*	7.65*	7.30*	5.20
Shapes, Std. Pittsburgh	5.50	5.50	5.50	5.275	4.10
Shapes, Std., Chicago	5.50	5.50	5.50	5.275	4.10
Shapes, deld., Philadelphia	5.77	5.77	5.77	5.545	4.38
Plates, Pittsburgh	5.30	5.30	5.30	5.10	4.10
Plates, Chicago	5.30	5.30	5.30	5.10	4.10
Plates, Coatesville, Pa.	5.30	5.30	5.30	5.10	4.35
Plates, Sparrows Point, Md.	5.30	5.30	5.30	5.10	4.10
Plates, Claymont, Del.	5.30	5.30	5.30	5.70	4.55
Sheets, H.R., Pittsburgh	5.10	5.10	5.10	4.925	3.925
Sheets, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Sheets, C.R., Pittsburgh	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Chicago	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Detroit	6.275	6.275	6.275	6.05-6.15	4.975
Sheets, Galv., Pittsburgh	6.875	6.875	6.875	6.60	5.275
Strip, H.R., Pittsburgh	5.10	5.10	5.10	4.925	3.975-4.425
Strip, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Strip, C.R., Pittsburgh	7.425	7.425	7.425	7.15	5.45-5.95
Strip, C.R., Chicago	7.425	7.425	7.425	7.15	5.70
Strip, C.R., Detroit	7.425	7.425	7.425	7.25	5.55-6.05
Wire, Basic, Pittsburgh	8.00	8.00	8.00	7.65	5.42-5.525
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	6.55-6.55
Tin plate (1.50 lb)box, Pitts.	$10.65	$10.65	$10.30	$10.30	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL

Billets, forging, Pitts. (NT)	$99.50	$99.50	$99.50	$96.00	$75.50
Wire rods ½-⅝" Pitts.	6.40	6.40	6.40	6.15	4.525

PIG IRON, Gross Ton

	Nov. 19 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$67.00	$67.00	$67.00	$67.00	$57.00
Basic, Valley	66.00	66.00	66.00	66.00	56.00
Basic, deld., Phila.	70.41	70.41	70.41	70.01	60.75
No. 2 Fdry, Neville Island, Pa.	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	70.51	61.25
No. 2 Fdry Birm.	62.50	62.50	62.50	62.50	52.88
No. 2 Fdry Birm. deld. Cin.	70.20	70.20	70.20	70.20	60.43
Malleable, Valley	66.50	66.50	66.50	66.50	56.50
Malleable, Chicago	66.50	66.50	66.50	66.50	56.50
Ferromanganese, net ton†	245.00	245.00	245.00	245.00	200.00

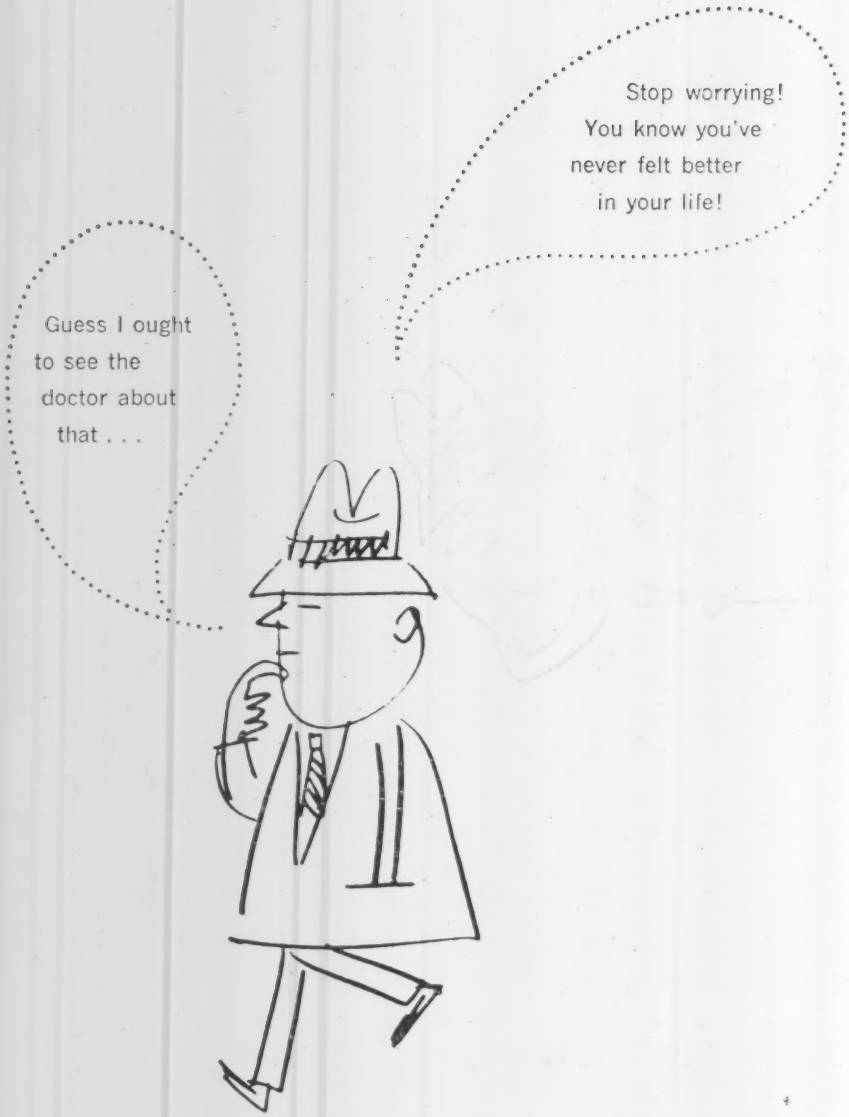
†74-76% Mn, Duquesne, Pa.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pittsburgh	$42.50	$44.50	$43.50	$32.50	$36.50
No. 1 Heavy Melt, E. Pa.	37.00	40.00	41.00	33.50	35.00
No. 1 Heavy Melt, Chicago	42.50	42.50	42.50	32.50	33.50
No. 1 Heavy Melt, Valley	43.50	43.50	43.50	31.50	35.50
No. 1 Heavy Melt, Cleve.	40.00	40.00	40.00	28.50	33.50
No. 1 Heavy Melt, Buffalo	35.50	35.50	35.50	32.50	34.50
Rails, Rerolling, Chicago	62.00	62.00	62.00	48.50	46.50
No. 1 Cast, Chicago	45.50	45.50	45.50	35.50	34.50

COKE, Net Ton

Beehive, Furn., Connisvl.	$15.25	$15.25	$15.25	$15.25	$14.75
Beehive, Fdry., Connisvl.	18.25	18.25	18.25	18.25	16.75
Oven, Fdry., Milwaukee	30.50	30.50	30.50	30.50	25.25



Don't be your own worst enemy! If you notice one of cancer's danger signals in yourself, don't talk yourself into thinking it's nothing to worry about. See your doctor. Only **he** can tell. To learn the seven danger signals and to find out how to guard yourself against cancer, call our nearest office or just write to "Cancer," in care of your local post office.

AMERICAN CANCER SOCIETY

Steel Prices

Mill prices as reported to STEEL, Nov. 19, cents per pound except as otherwise noted. Changes shown in italics. Code number following mill points indicates producing company. Key to producers, page 146; footnotes, page 145.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 ..... $76.00

INGOTS, Alloy (NT)
Detroit S41 ..... $82.00
Economy,Pa. B14 ..... 82.00
Farrell,Pa. S3 ..... 82.00
Lowellville,O. S3 ..... 82.00
Midland,Pa. C18 ..... 82.00
Munhall,Pa. U5 ..... 82.00
Sharon,Pa. S3 ..... 82.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bartonville,Ill. K4 ..... $82.00
Bessemer,Pa. U5 ..... 80.00
Buffalo R2 ..... 80.00
Clairton,Pa. U5 ..... 80.00
Ensley,Ala. T2 ..... 80.00
Fairfield,Ala. T2 ..... 80.00
Fontana,Calif. K1 ..... 90.50
Gary,Ind. U5 ..... 80.00
Johnstown,Pa. B3 ..... 80.00
Lackawanna,N.Y. B2 ..... 80.00
Munhall,Pa. U5 ..... 80.00
Owensboro,Ky. G8 ..... 80.00
S.Chicago,Ill. R2, U5 ..... 80.00
S.Duquesne,Pa. U5 ..... 80.00
Sterling,Ill. N15 ..... 80.00
Youngstown R2 ..... 80.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ..... $99.50
Buffalo R2 ..... 99.50
Canton, O. R2 ..... 102.00
Clairton,Pa. U5 ..... 99.50
Conshohocken,Pa. A3 ..... 104.50
Ensley,Ala. T2 ..... 99.50
Fairfield,Ala. T2 ..... 99.50
Farrell,Pa. S3 ..... 99.50
Fontana,Calif. K1 ..... 109.00
Gary,Ind. U5 ..... 99.50
Geneva,Utah C11 ..... 99.50
Houston S5 ..... 101.50
Johnstown,Pa. B2 ..... 99.50
Lackawanna,N.Y. B2 ..... 99.50
LosAngeles B3 ..... 109.00
Midland,Pa. C18 ..... 99.50
Munhall,Pa. U5 ..... 99.50
Owensboro,Ky. C8 ..... 99.50
Seattle B3 ..... 113.00
Sharon,Pa. S3 ..... 99.50
S.Chicago R2, U5, W14 ..... 99.50
S.Duquesne,Pa. U5 ..... 99.50
S.SanFrancisco B3 ..... 109.00
Warren,O. C17 ..... 99.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ..... $119.00
Bridgeport,Conn. C32 ..... 119.00
Buffalo R2 ..... 119.00
Canton,O. R2, T7 ..... 119.00
Conshohocken,Pa. A3 ..... 126.00
Detroit S41 ..... 119.00
Economy,Pa. B14 ..... 119.00
Farrell,Pa. S3 ..... 119.00
Fontana,Calif. K1 ..... 140.00
Gary,Ind. U5 ..... 119.00
Houston S5 ..... 121.00
Ind.Harbor,Ind. Y1 ..... 119.00
Johnstown,Pa. B2 ..... 119.00
Lackawanna,N.Y. B2 ..... 119.00
LosAngeles B3 ..... 139.00
Lowellville,O. S3 ..... 119.00
Massillon,O. R2 ..... 119.00
Midland,Pa. C18 ..... 119.00
Munhall,Pa. U5 ..... 119.00
Owensboro,Ky. G8 ..... 119.00
Sharon,Pa. S3 ..... 119.00
S.Chicago R2,U5,W14 ..... 119.00
S.Duquesne,Pa. U5 ..... 119.00
Struthers,O. Y1 ..... 119.00
Warren,O. C17 ..... 119.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ..... $122.50
Canton,O. R2 ..... 125.00
Cleveland R2 ..... 122.50
Gary,Ind. U5 ..... 122.50
S.Chicago,Ill. R2, W14 ..... 122.50
S.Duquesne,Pa. U5 ..... 122.50
Warren,O. C17 ..... 122.50

SKELP
Aliquippa,Pa. J5 ..... 5.05
Munhall,Pa. U5 ..... 5.05
Pittsburgh J5 ..... 5.05
Warren,O. R2 ..... 5.05
Youngstown R2, U5 ..... 5.05

WIRE RODS
AlabamaCity,Ala. R2 ..... 6.40
Aliquippa,Pa. J5 ..... 6.40
Alton,Ill. L1 ..... 6.60
Bartonville,Ill. K4 ..... 6.50
Buffalo W12 ..... 6.40
Cleveland A7 ..... 6.40
Donora,Pa. A7 ..... 6.40
Fairfield,Ala. T2 ..... 6.40
Houston S5 ..... 6.65
IndianaHarbor,Ind. Y1 ..... 6.40
Johnstown,Pa. B2 ..... 6.40
Joliet,Ill. A7 ..... 6.40
KansasCity,Mo. S5 ..... 6.65
Kokomo,Ind. C16 ..... 6.50
LosAngeles B3 ..... 7.20
Minnequa,Colo. C10 ..... 6.65
Monessen,Pa. P7 ..... 6.40
N.Tonawanda,N.Y. B11 ..... 6.40
Pittsburg,Calif. C11 ..... 7.20
Portsmouth,O. P12 ..... 6.40
Roebling,N.J. R5 ..... 6.50
S.Chicago,Ill. R2, W14 ..... 6.40
SparrowsPoint,Md. B2 ..... 6.50
Sterling,Ill.(1) N15 ..... 6.40
Sterling,Ill. N15 ..... 6.50
Struthers,O. Y1 ..... 6.40
Worcester,Mass. A7 ..... 6.70

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2 ..... 5.50
Aliquippa,Pa. J5 ..... 5.50
Atlanta A11 ..... 5.70
Bessemer,Ala. T2 ..... 5.50
Bethlehem,Pa. B2 ..... 5.55
Birmingham C15 ..... 5.50
Clairton,Pa. U5 ..... 5.50
Fairfield,Ala. T2 ..... 5.50
Fontana,Calif. K1 ..... 6.30
Gary,Ind. U5 ..... 5.50
Geneva,Utah C11 ..... 5.50
Houston S5 ..... 5.60
Ind.Harbor,Ind. I-2, Y1 ..... 5.50
Johnstown,Pa. B2 ..... 5.55
Joliet,Ill. P22 ..... 5.50
KansasCity,Mo. S5 ..... 5.60
Lackawanna,N.Y. B2 ..... 5.55
LosAngeles B3 ..... 6.20
Minnequa,Colo. C10 ..... 5.80
Munhall,Pa. U5 ..... 5.50
Niles,Calif. P1 ..... 6.25
Phoenixville,Pa. P4 ..... 5.55
Portland,Oreg. O4 ..... 6.25
Seattle B3 ..... 6.25
S.Chicago,Ill. U5, W14 ..... 5.50
S.SanFrancisco B3 ..... 6.15
Sterling,Ill. N15 ..... 5.50
Torrance,Calif. C11 ..... 6.20
Weirton,W.Va. W6 ..... 5.50

Wide Flange
Bethlehem,Pa. B2 ..... 5.55
Clairton,Pa. U5 ..... 5.50
Fontana,Calif. K1 ..... 6.45
IndianaHarbor,Ind. I-2 ..... 5.50
Lackawanna,N.Y. B2 ..... 5.55
Munhall,Pa. U5 ..... 5.50
Phoenixville,Pa. P4 ..... 5.55
S.Chicago,Ill. U5 ..... 5.50
Weirton,W.Va. W6 ..... 5.50

Alloy Std. Shapes
Aliquippa,Pa. J5 ..... 6.80
Clairton,Pa. U5 ..... 6.80
Gary,Ind. U5 ..... 6.80
Houston S5 ..... 6.90
Munhall,Pa. U5 ..... 6.80
S.Chicago,Ill. U5, W14 ..... 6.80

H.S., L.A. Std. Shapes
Aliquippa,Pa. J5 ..... 8.05
Bessemer,Ala. T2 ..... 8.05
Bethlehem,Pa. B2 ..... 8.10
Clairton,Pa. U5 ..... 8.05
Fairfield,Ala. T2 ..... 8.05
Fontana,Calif. K1 ..... 8.85
Gary,Ind. U5 ..... 8.05
Geneva,Utah C11 ..... 8.05
Houston S5 ..... 8.15
Ind.Harbor,Ind. I-2, Y1 ..... 8.05
Johnstown,Pa. B2 ..... 8.10
KansasCity,Mo. S5 ..... 8.15
Lackawanna,N.Y. B2 ..... 8.10
LosAngeles B3 ..... 8.75
Munhall,Pa. U5 ..... 8.05
Seattle B3 ..... 8.80
S.Chicago,Ill. U5, W14 ..... 8.05
S.SanFrancisco B3 ..... 8.70
Struthers,O. Y1 ..... 8.05

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 ..... 8.10
Ind.Harbor,Ind. I-2 ..... 8.05
Lackawanna,N.Y. B2 ..... 8.10
Munhall,Pa. U5 ..... 8.05
S.Chicago,Ill. U5 ..... 8.05

PILING

BEARING PILES
Bethlehem,Pa. B2 ..... 5.55
Ind.Harbor,Ind. I-2 ..... 5.50
Lackawanna,N.Y. B2 ..... 5.55
Munhall,Pa. U5 ..... 5.50
S.Chicago,Ill. I-2, U5 ..... 5.50

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ..... 6.50
Lackawanna,N.Y. B2 ..... 6.50
Munhall,Pa. U5 ..... 6.50
S.Chicago,Ill. I-2, U5 ..... 6.50
Weirton,W.Va. W6 ..... 6.50

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..... 5.30
Aliquippa,Pa. J5 ..... 5.30
Ashland,Ky.(15) A10 ..... 5.30
Atlanta A11 ..... 5.50
Bessemer,Ala. T2 ..... 5.30
Clairton,Pa. U5 ..... 5.30
Claymont,Del. C22 ..... 5.30
Cleveland J5, R2 ..... 5.30
Coatesville,Pa. L7 ..... 5.30
Conshohocken,Pa. A3 ..... 5.30
Ecorse,Mich. G4 ..... 5.30
Fairfield,Ala. T2 ..... 5.30
Farrell,Pa. S3 ..... 5.30
Fontana,Calif.(30) K1 ..... 6.10
Gary,Ind. U5 ..... 5.30
Geneva,Utah C11 ..... 5.30
GraniteCity,Ill. G4 ..... 5.40
Harrisburg,Pa. P4 ..... 5.50
Houston S5 ..... 5.40
Ind.Harbor,Ind. I-2, Y1 ..... 5.30
Johnstown,Pa. B2 ..... 5.30
Lackawanna,N.Y. B2 ..... 5.30
Mansfield,O. E6 ..... 5.70
Minnequa,Colo. C10 ..... 6.15
Munhall,Pa. U5 ..... 5.30
Newport,Ky. A2 ..... 5.30
Pittsburgh J5 ..... 5.30
Riverdale,Ill. A1 ..... 5.30
Seattle B3 ..... 6.20
Sharon,Pa. S3 ..... 5.30
S.Chicago,Ill. U5, W14 ..... 5.30
SparrowsPoint,Md. B2 ..... 5.30
Sterling,Ill. N15 ..... 5.50
Steubenville,O. W10 ..... 5.30
Warren,O. R2 ..... 5.30
Youngstown U5, Y1 ..... 5.30
Youngstown(27) R2 ..... 5.30

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 ..... 6.75
Fontana,Calif. K1 ..... 7.85
Geneva,Utah C11 ..... 7.05
Houston S5 ..... 7.15
Johnstown,Pa. B2 ..... 7.05
SparrowsPoint,Md. B2 ..... 7.05

PLATES, Wrought Iron
Economy,Pa. B14 ..... 13.55

PLATES, H.S., L.A.
Aliquippa,Pa. J5 ..... 7.95
Ashland,Ky. A10 ..... 7.95
Bessemer,Ala. T2 ..... 7.95
Clairton,Pa. U5 ..... 7.95
Claymont,Del. C22 ..... 7.95
Cleveland J5, R2 ..... 7.95
Coatesville,Pa. L7 ..... 7.95
Conshohocken,Pa. A3 ..... 7.95
Economy,Pa. B14 ..... 7.95
Ecorse,Mich. G5 ..... 7.95
Fairfield,Ala. T2 ..... 7.95
Farrell,Pa. S3 ..... 7.95
Fontana,Calif.(30) K1 ..... 8.75
Gary,Ind. U5 ..... 7.95
Geneva,Utah C11 ..... 7.95
Houston S5 ..... 8.05
Ind.Harbor,Ind. I-2, Y1 ..... 7.95
Johnstown,Pa. B2 ..... 7.95
Munhall,Pa. U5 ..... 7.95
Pittsburgh J5 ..... 7.95
Seattle B3 ..... 8.85
Sharon,Pa. S3 ..... 7.95
S.Chicago,Ill. U5, W14 ..... 7.95
SparrowsPoint,Md. B2 ..... 7.95
Warren,O. R2 ..... 7.95
Youngstown U5, Y1 ..... 7.95

PLATES, ALLOY
Aliquippa,Pa. J5 ..... 7.50
Claymont,Del. C22 ..... 7.50
Coatesville,Pa. L17 ..... 7.50
Economy,Pa. B14 ..... 7.50
Fargell,Pa. S3 ..... 7.50
Fontana,Calif. K1 ..... 8.30
Gary,Ind. U5 ..... 7.50
Houston S5 ..... 7.60
Ind.Harbor,Ind. Y1 ..... 7.50
Johnstown,Pa. B2 ..... 7.50
Lowellville,O. S3 ..... 7.50
Munhall,Pa. U5 ..... 7.50
Newport,Ky. A2 ..... 7.50
Pittsburgh J5 ..... 7.50
Seattle B3 ..... 8.40
Sharon,Pa. S3 ..... 7.50
S.Chicago,Ill. U5, W14 ..... 7.50
SparrowsPoint,Md. B2 ..... 7.50
Youngstown Y1 ..... 7.50

FLOOR PLATES
Cleveland J5 ..... 6.375
Conshohocken,Pa. A3 ..... 6.375
Ind.Harbor,Ind. I-2 ..... 6.375
Munhall,Pa. U5 ..... 6.375
Pittsburgh J5 ..... 6.375
S.Chicago,Ill. U5 ..... 6.375

PLATES, Ingot Iron
Ashland c.l.(15) A10 ..... 5.55
Ashland l.c.l.(15) A10 ..... 6.05
Cleveland c.l. R2 ..... 6.05
Warren,O. c.l. R2 ..... 6.05

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ..... 5.675
Aliquippa,Pa.(9) J5 ..... 5.675
Alton,Ill. L1 ..... 5.875
Atlanta(9) A11 ..... 5.875
Bessemer,Ala.(9) T2 ..... 5.675
Birmingham(9) C15 ..... 5.675
Buffalo(9) R2 ..... 5.675
Canton,O.(23) R2 ..... 6.15
Clairton,Pa.(9) U5 ..... 5.675
Cleveland(9) R2 ..... 5.675
Ecorse,Mich.(9) G5 ..... 5.675
Emeryville,Calif. J7 ..... 6.425
Fairfield,Ala.(9) T2 ..... 5.675
Fairless,Pa.(9) U5 ..... 5.825
Fontana,Calif.(9) K1 ..... 6.375
Gary,Ind.(9) U5 ..... 5.675
Houston(9) S5 ..... 5.925
Ind.Harbor(9) I-2, Y1 ..... 5.675
Johnstown,Pa.(9) B2 ..... 5.675
Joliet,Ill. P22 ..... 5.675
KansasCity,Mo.(9) S5 ..... 5.925
Lackawanna(9) B2 ..... 5.675
LosAngeles(9) B3 ..... 6.375
Massillon,O.(23) R2 ..... 6.15
Midland,Pa.(23) C18 ..... 6.025
Milton,Pa. M18 ..... 5.825
Minnequa,Colo. C10 ..... 6.125
Niles,Calif. P1 ..... 6.375
N.Tonawanda,N.Y.(23) B11 ..... 6.025
Owensboro,Ky.(9) G8 ..... 6.025
Pittsburg,Calif.(9) C11 ..... 6.375
Pittsburgh(9) J5 ..... 5.675
Portland,Oreg. O4 ..... 6.425
Riverdale,Ill.(9) A1 ..... 5.675
Seattle B3, N14 ..... 6.425
S.Chicago(9) R2,U5,W14 ..... 5.675
S.Duquesne,Pa.(9) U5 ..... 5.675
S.SanFran.,Calif.(9) B3 ..... 6.425
Sterling,Ill.(1)(9) N15 ..... 5.675
Sterling,Ill.(9) N15 ..... 5.775
Struthers,O.(9) Y1 ..... 5.675
Tonawanda,N.Y. B12 ..... 5.675
Torrance,Calif.(9) C11 ..... 6.375
Warren,O. C17 ..... 6.025
Youngstown(9) R2, U5 ..... 5.675

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 ..... 6.725
Bethlehem,Pa. B2 ..... 6.725
Bridgeport,Conn. C32 ..... 6.80
Buffalo R2 ..... 6.725
Canton,O. R2, T7 ..... 6.725
Clairton,Pa. U5 ..... 6.725
Detroit S41 ..... 6.725
Economy,Pa. B14 ..... 6.725
Ecorse,Mich. G5 ..... 6.725
Fairless,Pa. U5 ..... 6.875
Farrell,Pa. S3 ..... 6.725
Fontana,Calif. K1 ..... 7.775
Gary,Ind. U5 ..... 6.725
Houston S5 ..... 6.975
Ind.Harbor,Ind. I-2, Y1 ..... 6.725
Johnstown,Pa. B2 ..... 6.725
KansasCity,Mo. S5 ..... 6.975
Lackawanna,N.Y. B2 ..... 6.725
LosAngeles B3 ..... 7.775
Lowellville,O. S3 ..... 6.725
Massillon,O. R2 ..... 6.725
Midland,Pa. C18 ..... 6.725
Owensboro,Ky. G8 ..... 6.725
Pittsburgh J5 ..... 6.725
Sharon,Pa. S3 ..... 6.725
S.Chicago R2, U5, W14 ..... 6.725
S.Duquesne,Pa. U5 ..... 6.725
Struthers,O. Y1 ..... 6.725
Warren,O. C17 ..... 6.725
Youngstown U5 ..... 6.725

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 ..... 8.30
Bessemer,Ala. T2 ..... 8.30
Bethlehem,Pa. B2 ..... 8.30
Clairton,Pa. U5 ..... 8.30
Cleveland R2 ..... 8.30
Ecorse,Mich. G5 ..... 8.30
Fairfield,Ala. T2 ..... 8.30
Fontana,Calif. K1 ..... 9.00
Gary,Ind. U5 ..... 8.30
Houston S5 ..... 8.55
Ind.Harbor,Ind. Y1 ..... 8.30
Johnstown,Pa. B2 ..... 8.30
KansasCity,Mo. S5 ..... 8.55
Lackawanna,N.Y. B2 ..... 8.30
LosAngeles B3 ..... 9.00
Pittsburgh J5 ..... 8.30
Seattle B3 ..... 9.05
S.Chicago,Ill. R2, W14 ..... 8.30
S.Duquesne,Pa. U5 ..... 8.30
S.SanFrancisco B3 ..... 9.05
Struthers,O. Y1 ..... 8.30
Youngstown U5 ..... 8.30

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..... 5.825
Houston(9) S5 ..... 5.925
KansasCity,Mo.(9) S5 ..... 5.925
Lackawanna(9) B2 ..... 5.675
Sterling,Ill. N15 ..... 5.775
Sterling,Ill.(1) N15 ..... 5.675
Tonawanda,N.Y. B12 ..... 5.675

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 ..... 5.675
Atlanta A11 ..... 5.875
Joliet,Ill. P22 ..... 5.675
Minnequa,Colo. C10 ..... 6.125
Niles,Calif. P1 ..... 6.375
Pittsburgh J5 ..... 5.675
Portland,Oreg. O4 ..... 6.425
SanFrancisco S7 ..... 6.52
Seattle B3 ..... 6.425

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 ..... 6.80
Clairton,Pa. U5 ..... 6.80
Gary,Ind. U5 ..... 6.80
Houston S5 ..... 7.05
KansasCity,Mo. S5 ..... 7.05
Pittsburgh J5 ..... 6.80
Youngstown U5 ..... 6.80

BARS, C.F. Leaded (Including leaded extra)
Carbon
LosAngeles P2, S30 ..... 11.75*
Alloy
Ambridge,Pa. W18 ..... 10.175
BeaverFalls,Pa. M12 ..... 10.175
Camden,N.J. P13 ..... 10.35
Chicago W18 ..... 10.175
Elyria,O. W8 ..... 10.175
Monaca,Pa. S17 ..... 10.175
Newark,N.J. W18 ..... 10.35
SpringCity,Pa. K3 ..... 10.35

*Grade A; add 0.050c for Grade B.

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ..... 7.65
BeaverFalls,Pa. M12,R2 ..... 7.65
Birmingham C15 ..... 8.25
Buffalo B5 ..... 7.70
Camden,N.J. P13 ..... 8.10
Carnegie,Pa. C12 ..... 7.65
Chicago W18 ..... 7.65
Cleveland A7, C20 ..... 7.65
Detroit B5, P17 ..... 7.85
Detroit S41 ..... 7.65
Donora,Pa. A7 ..... 7.65
Elyria,O. W8 ..... 7.65
FranklinPark,Ill. N5 ..... 7.65
Gary,Ind. R2 ..... 7.65
GreenBay,Wis. F7 ..... 7.65
Hammond,Ind. J5, L2 ..... 7.65
Hartford,Conn. R2 ..... 8.15
Harvey,Ill. B5 ..... 7.65
LosAngeles(49) S30 ..... 9.10
LosAngeles(49) P2, R2 ..... 9.10
Mansfield,Mass. B2 ..... 8.20
Massillon,O. R2, R8 ..... 7.65
Midland,Pa. C18 ..... 7.65
Monaca,Pa. S17 ..... 7.65
Newark,N.J. W18 ..... 8.10
NewCastle,Pa.(17) B4 ..... 7.65
Pittsburgh J5 ..... 7.65
Plymouth,Mich. P5 ..... 7.90
Putnam,Conn. W18 ..... 8.20
Readville,Mass. C14 ..... 8.20
S.Chicago,Ill. W14 ..... 7.65
SpringCity,Pa. K3 ..... 8.10
Struthers,O. Y1 ..... 7.65
Warren,O. C17 ..... 7.65
Waukegan,Ill. A7 ..... 7.65
Willimantic,Conn. J5 ..... 8.15
Youngstown F3, Y1 ..... 7.65

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19 ..... 8.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ..... 9.025
BeaverFalls,Pa. M12,R2 ..... 9.025
Bethlehem,Pa. B2 ..... 9.025
Bridgeport,Conn. C32 ..... 9.175
Buffalo B5 ..... 9.025
Camden,N.J. P13 ..... 9.20
Canton,O. T7 ..... 9.025
Carnegie,Pa. C12 ..... 9.025
Chicago W18 ..... 9.025
Cleveland A7, C20 ..... 9.025
Detroit B5, P17 ..... 9.025
Detroit S41 ..... 9.025
Donora,Pa. A7 ..... 9.025
Elyria,O. W8 ..... 9.025
FranklinPark,Ill. N5 ..... 9.025
Gary,Ind. R2 ..... 9.025
GreenBay,Wis. F7 ..... 9.025
Hammond,Ind. J5, L2 ..... 9.025
Hartford,Conn. R2 ..... 9.325
Harvey,Ill. B5 ..... 9.025
Lackawanna,N.Y. B2 ..... 9.025
LosAngeles P2, S30 ..... 11.00
Mansfield,Mass. B5 ..... 9.325
Massillon,O. R2, R8 ..... 9.025
Midland,Pa. C18 ..... 9.025
Monaca,Pa. S17 ..... 9.025
Newark,N.J. W18 ..... 9.20
Plymouth,Mich. P5 ..... 9.225
S.Chicago,Ill. W14 ..... 9.025
SpringCity,Pa. K3 ..... 9.20
Struthers,O. Y1 ..... 9.025
Warren,O. C17 ..... 9.025
Waukegan,Ill. A7 ..... 9.025
Willimantic,Conn. J5 ..... 9.325
Worcester,Mass. A7 ..... 9.325
Youngstown F3, Y1 ..... 9.025

BARS, Reinforcing, Billet (To Fabricators)

AlabamaCity,Ala. R2 ..5.675
Atlanta A11 ..5.675
Birmingham C15 ..5.675
Buffalo R2 ..5.675
Cleveland R2 ..5.675
Ecorse,Mich. G5 ..5.675
Emeryville,Calif. J7 ..6.425
Fairfield,Ala. T2 ..5.675
Fairless Pa. U5 ..5.825
Fontana,Calif. K1 ..6.375
Ft.Worth Tex.(4)(26)T4 6.125
Gary,Ind. U5 ..5.675
Houston S5 ..5.925
Ind.Harbor,Ind. I-2, Y1 5.675
Johnstown,Pa. B2 ..5.675
Joliet,Ill. P22 ..5.675
KansasCity,Mo. S5 ..5.925
Kokomo,Ind. C16 ..5.775
Lackawanna,N.Y. B2 ..5.675
LosAngeles B3 ..6.375
Madison,Ill. I-1 ..5.875
Milton,Pa. M18 ..5.825
Minnequa,Colo. C10 ..6.125
Niles,Calif. P1 ..6.375
Pittsburg,Calif. C11 ..6.375
Pittsburgh J5 ..5.675
Portland,Oreg. O4 ..6.425
SandSprings,Okla. S5 ..5.925
Seattle B3, N14 ..6.425
S.Chicago,Ill. R2, W14 5.675
S.Duquesne,Pa. U5 ..5.675
S.SanFrancisco B3 ..6.425
SparrowsPoint,Md. B2 ..5.675
Sterling,Ill.(1) N15 ..5.675
Sterling,Ill. N15 ..5.775
Struthers,O. Y1 ..5.675
Tonawanda,N.Y. B12 ..6.10
Torrance,Calif. C11 ..6.375
Youngstown R2, U5 ..5.675

BARS, Reinforcing, Billet (Fabricated to Consumers)

Baltimore B2 ..7.42
Boston B2, U5 ..8.15
Chicago U5 ..7.41
Cleveland U5 ..7.39
Houston S5 ..7.60
Johnstown,Pa. B2 ..7.33
KansasCity,Mo. S5 ..7.60
Lackawanna,N.Y. B2 ..7.35
Marion,O. P11 ..6.70
Newark,N.J. U5 ..7.80
Philadelphia U5 ..7.63
Pittsburgh J5 U5 ..7.35
SandSprings,Okla. S5 ..7.60
Seattle B3, N14 ..7.95
SparrowsPt.,Md. B2 ..7.33
St. Paul U5 ..8.17
Williamsport,Pa. S19 ..7.25

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.90
Economy,Pa.(D.R.)B14 18.55
Economy(Staybolt)B14 19.90

BARS, Rail Steel

ChicagoHts.(3) C2, I-2 5.575
ChicagoHts.(4)(44) I-2 5.675
ChicagoHts.(4) C2 ..5.675
Franklin,Pa.(3) F5 ..5.575
Franklin,Pa.(4) F5 ..5.675
JerseyShore,Pa.(3) J8 ..5.55
Marion,O.(3) P11 ..5.575
Tonawanda(3) B12 ..5.575
Tonawanda(4) B12 ..6.10

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

AlabamaCity,Ala. R2 ..5.10
Allenport,Pa. P7 ..5.10
Aliquippa,Pa. J5 ..5.10
Ashland,Ky.(8) A10 ..5.10
Cleveland J5, R2 ..5.10
Conshohocken,Pa. A3 ..5.15
Detroit(8) M1 ..5.10
Ecorse,Mich. G5 ..5.10
Fairfield,Ala. T2 ..5.10
Fairless,Pa. U5 ..5.15
Farrell,Pa. S3 ..5.10
Fontana,Calif. K1 ..5.525
Gary,Ind. U5 ..5.10
Geneva,Utah C11 ..5.20
GraniteCity,Ill.(8) G4 ..5.20
Ind.Harbor,Ind. I-2, Y1 5.10
Irvin,Pa. U5 ..5.10
Lackawanna,N.Y. B2 ..5.10
Mansfield,O. E6 ..5.10
Munhall,Pa. U5 ..5.10
Newport,Ky. A2 ..5.10
Niles,O. M21, S3 ..5.10
Pittsburg,Calif. C11 ..5.80
Pittsburgh J5 ..5.10
Portsmouth,O. P12 ..5.10
Riverdale,Ill. A1 ..5.10
Sharon,Pa. S3 ..5.10
S.Chicago,Ill. U5, W14 ..5.10
SparrowsPoint,Md. B2 ..5.10
Steubenville,O. W10 ..5.10
Warren,O. R2 ..5.10
Weirton,W.Va. W6 ..5.10
Youngstown U5, Y1 ..5.10

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21, S3 ..6.275

SHEETS, H.R. Alloy

Gary,Ind. U5 ..8.40
Ind.Harbor,Ind. Y1 ..8.40
Irvin,Pa. U5 ..8.40
Munhall,Pa. U5 ..8.40
Newport,Ky. A2 ..8.40
Youngstown U5, Y1 ..8.40

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Aliquippa,Pa. J5 ..7.525
Ashland,Ky. A10 ..7.525
Cleveland J5, R2 ..7.525
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 ..7.525
Fairfield,Ala. T2 ..7.525
Fairless,Pa. U5 ..7.575
Farrell,Pa. S3 ..7.525
Fontana,Calif. K1 ..8.25
Gary,Ind. U5 ..7.525
Ind.Harbor,Ind. I-2, Y1 7.525
Irvin,Pa. U5 ..7.525
Lackawanna(35) B2 ..7.525
Munhall,Pa. U5 ..7.525
Niles,O. S3 ..7.525
Pittsburgh J5 ..7.525
S.Chicago,Ill. U5, W14 7.525
Sharon,Pa. S3 ..7.525
SparrowsPoint(36) B2 ..7.525
Warren,O. R2 ..7.525
Weirton,W.Va. W6 ..7.525
Youngstown U5, Y1 ..7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..5.35
Cleveland R2 ..5.875
Warren,O. R2 ..5.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 ..7.05
Middletown,O. A10 ..6.775
Warren,O. R2 ..7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 ..6.275
Allenport,Pa. P7 ..6.275
Aliquippa,Pa. J5 ..6.275
Cleveland J5, R2 ..6.275
Conshohocken,Pa. A3 ..6.325
Detroit M1 ..6.275
Ecorse,Mich. G5 ..6.275
Fairfield,Ala. T2 ..6.275
Fairless,Pa. U5 ..6.325
Follansbee,W.Va. F4 ..6.275
Fontana,Calif. K1 ..7.40
Gary,Ind. U5 ..6.275
GraniteCity,Ill. G4 ..6.375
Ind.Harbor,Ind. I-2, Y1 6.275
Irvin,Pa. U5 ..6.275
Lackawanna,N.Y. B2 ..6.275
Mansfield,O. E6 ..6.275
Middletown,O. A10 ..6.275
Newport,Ky. A2 ..6.275
Pittsburg,Calif. C11 ..7.225
Pittsburgh J5 ..6.275
Portsmouth,O. P12 ..6.275
SparrowsPoint,Md. B2 ..6.275
Steubenville,O. W10 ..6.275
Warren,O. R2 ..6.275
Weirton,W.Va. W6 ..6.275
Yorkville,O. W10 ..6.275
Youngstown Y1 ..6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Aliquippa,Pa. J5 ..9.275
Cleveland J5, R2 ..9.275
Ecorse,Mich. G5 ..9.275
Fairless,Pa. U5 ..9.325
Fontana,Calif. K1 ..10.40
Gary,Ind. U5 ..9.275
Ind.Harbor,Ind. I-2, Y1 9.275
Irvin,Pa. U5 ..9.275
Lackawanna(37) B2 ..9.275
Pittsburgh J5 ..9.275
SparrowsPoint(38) B2 ..9.275
Warren,O. R2 ..9.275
Weirton,W.Va. W6 ..9.275
Youngstown Y1 ..9.275

SHEETS, Culvert

	Cu Steel	Cu Fe
Ala.City,Ala.	R2 7.225	...
Ashland,Ky.	A10 7.225	7.475
Canton,O.	R2 ...7.225	7.75
Fairfield	T2 ...7.225	7.475
Gary,Ind.	U5 ...7.225	7.475
GraniteCity,Ill.	G4 7.225	...
Ind.Harbor	I-2 ...7.225	7.475
Irvin,Pa.	U5 ...7.225	7.475
Kokomo,Ind.	C16 7.325	...
MartinsFry.	W10 7.225	7.475
Pitts.Calif.	C11 7.975	...
Sparrowspt.	B2 ...7.225	...
Pittsburgh	J5 ...7.225	...

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ...7.475

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2 6.875†
Ashland,Ky. A10 ...6.875†
Canton,O. R2 ...6.875‡
Dover,O. E6 ...6.875†
Fairfield,Ala. T2 ...6.875†
Gary,Ind. U5 ...6.875†
GraniteCity,Ill. G4 ...6.975*
Ind.Harbor,Ind. I-2 ...6.875†
Irvin,Pa. U5 ...6.875†
Kokomo,Ind. C16 ...6.975†
MartinsFerry,O. W10 6.875*
Middletown,O. A10 ...6.875*
Pittsburg,Calif. C11 ...7.625*
Pittsburgh J5 ...6.875†
SparrowsPt.,Md. B2 ...6.875†
Warren,O. R2 ...6.875†
Weirton,W.Va. W6 ...6.875*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ...7.325

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 ...10.125
SparrowsPt.(39) B2 ..10.025
Pittsburgh J5 ...10.125

SHEETS, Galvannealed Steel

Canton,O. R2 ...7.275
Irvin,Pa. U5 ...7.275

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 ... 7.125
Middletown,O. A10 ...7.125

SHEETS, Electrogalvanized

Cleveland(28) R2 ...7.65
Niles,O.(28) R2 ...7.65
Youngstown J5 ...7.50
Weirton,W.Va. W6 ...7.50

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 9.525
Butler,Pa. A10 (type 2) 9.625

SHEETS, Enameling Iron

Ashland,Ky. A10 ...6.775
Cleveland R2 ...6.775
Fairfield,Ala. T2 ...6.775
Gary,Ind. U5 ...6.775
GraniteCity,Ill. G4 ...6.875
Ind.Harbor,Ind. I-2,Y1 6.775
Irvin,Pa. U5 ...6.775
Middletown,O. A10 ...6.775
Niles,O. M21, S3 ...6.775
Youngstown Y1 ...6.775

BLUED STOCK, 29 Gage

Dover,O. E6 ...8.70
Follansbee,W.Va. F4 ...8.70
Ind.Harbor,Ind. I-2 ...8.70
Mansfield,O. E6 ...8.70
Warren,O. R2 ...8.70
Yorkville,O. W10 ...8.70

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va. W10 7.225
Gary,Ind. U5 ...7.225
Mansfield,O. E6 ...7.225
Middletown,O. A10 ...7.225
Niles,O. M21, S3 ...7.225
Warren,O. R2 ...7.225
Weirton,W.Va. W6 ...7.225

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ...7.625

Key To Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc
C32 Carpenter Steel of N.Eng.

D2 Detroit Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.
E10 Enamel Prod. & Plating

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Special Wire
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.
N20 Neville Ferro Alloy Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co., Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless & Strip Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U3 Union Wire Rope Corp.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Steel Div., Associated Spring Corp.
W2 Wallingford Steel Corp.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ..5.10
Allenport,Pa. P7 .....5.10
Alton,Ill. L1 .....5.30
Ashland,Ky.(8) A10 ....5.10
Atlanta A11 .....5.10
Bessemer,Ala. T2 .....5.10
Birmingham C15 .....5.10
Buffalo(27) R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Ind.Harbor,Ind. I-2, Y1 5.10
Johnstown,Pa.(25) B2 ..5.10
Lackawanna,N.Y.(25) B2 5.10
LosAngeles(25) B3 ....5.85
LosAngeles C1 .....5.60
Minnequa,Colo. C10 ....6.20
Riverdale,Ill. A1 .....5.10
SanFrancisco S7 .....6.60
Seattle(25) B3 .....6.10
Seattle N14 .....6.60
Sharon,Pa. S3 .....5.10
S.Chicago W14 .....5.10
S.SanFrancisco(25) B3..5.85
SparrowsPoint,Md. B2 ..5.10
Torrance,Calif. C11 ....5.85
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5, Y1 ....5.10

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18 .....8.40
Farrell,Pa. S3 .....8.40
Gary,Ind. U5 .....8.40
Houston S5 .....8.65
Ind.Harbor,Ind. Y1 ....8.40
KansasCity,Mo. S5 ....8.65
LosAngeles B3 .....9.60
Lowellville,O. S3 .....8.40
Newport,Ky. A2 .....8.40
Sharon,Pa. A2, S3 ....8.40
S.Chicago,Ill. W14 .....8.40
Youngstown U5, Y1 ....8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland,Ky. A10 .....7.575
Bessemer,Ala. T2 .....7.575
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.575
Fairfield,Ala. T2 .....7.575
Farrell,Pa. S3 .....7.575
Gary,Ind. U5 .....7.575
Ind.Harbor,Ind. I-2,Y1 7.575
Lackawanna,N.Y. B2 ..7.575
LosAngeles(25) B3 ....8.325
Seattle(25) B3 .....8.575
Sharon,Pa. S3 .....7.575
S.Chicago,Ill. W14 .....7.575
S.SanFrancisco(25) B3 8.325
SparrowsPoint,Md. B2 ..7.575
Warren,O. R2 .....7.575
Weirton,W.Va. W6 .....7.575
Youngstown U5, Y1 .....7.575

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ...5.35
Warren,O. R2 .....5.875

STRIP, Cold-Rolled Carbon

Anderson,Ind G6 .....7.425
Baltimore T6 .....7.425
Boston T6 .....7.975
Buffalo S40 .....7.425
Cleveland A7, J5 .....7.425
Dearborn,Mich. S3 ....7.425
Detroit D2, M1, P20 ..7.425
Dover, O G6 .....7.425
Evanston,Ill. M22 .....7.525
Farrell, Pa. S3 .....7.425
Follansbee,W.Va. F4 ..7.425
Fontana,Calif. K1 .....9.20
FranklinPark,Ill. T6 ..7.525
Ind.Harbor,Ind. Y1 ....7.425
Indianapolis S41 .....7.575
LosAngeles C1, S11 ....9.30
McKeesport,Pa. E10 ...7.525
NewBedford,Mass. R10 7.875
NewBritain,Conn. S15..7.875
NewCastle,Pa. B4, E5 ..7.425
NewHaven,Conn. D2 ...7.875
NewKensington,Pa. A6 7.425
Pawtucket,R.I. R3 .....7.975
Pawtucket,R.I. N8 .....7.975
Philadelphia P24 .....7.875
Pittsburgh J5 .....7.425
Riverdale,Ill. A1 .....7.525
Rome,N.Y.(32) R6 .....7.425
Sharon,Pa. S3 .....7.425
Trenton,N.J.(31) R5 ..8.875
Wallingford,Conn. W2 ..7.875
Warren,O. R2, T5 ....7.425
Worcester,Mass. A7 ..7.975
Youngstown S41, Y1 ..7.425
Boston T6 .....15.90
Carnegie,Pa. S18 .....15.55
Cleveland A7 .....15.55
Dover,O. G6 .....15.55
Farrell,Pa. S3 .....15.55
FranklinPark,Ill. T6 ..15.55
Harrison,N.J. C18 ....15.55*
Indianapolis S41 .....15.70
LosAngeles S41 .....17.75*
Lowellville,O. S3 .....15.55
Pawtucket,R.I. N8 ....15.90
Riverdale,Ill. A1 .....15.55
Sharon,Pa. S3 .....15.55
Worcester,Mass. A7 ..15.85
Youngstown S41 .....15.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

STRIP, Cold-Rolled Alloy

Cleveland A7 .....10.80
Dearborn,Mich. S3 .....10.80
Dover,O. G6 .....10.80
Farrell,Pa. S3 .....10.80
Ind.Harbor,Ind. Y1 ....10.80
Sharon,Pa. S3 .....10.80
Warren,O. R2 .....10.80

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1		10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. S3	9.05	10.50	12.70		
Detroit D2	9.05	10.50	12.70	15.70	
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	
Farrell,Pa. S3	8.95	10.40	12.60	15.60	18.55
Fostoria,O. S1	10.05	10.40	12.60	15.60	
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18			12.90	16.10	19.30
Indianapolis S41	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	
LosAngeles S41	11.15	12.60	14.80		
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	
NewKensington,Pa. A6	8.95	10.40	12.60	15.60	
New York W3		10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5		10.70	12.90	15.90	18.85
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40*	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown S41	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol, Conn. W1	18.85	22.95	27.80
Buffalo W12	18.85		
Fostoria,O. S1	19.05	22.15	
FranklinPark,Ill. T6	19.20	23.30	28.15
Harrison,N.J. C18	18.85	22.95	27.80
NewYork W3	18.85	22.95	27.80
Palmer,Mass. W12	18.85		
Trenton,N.J. R5	18.85	22.95	27.80
Worcester,Mass. A7, T6	18.85	22.95	27.80
Youngstown S41	19.20	23.30	28.15

Weirton,W.Va. W6 ....10.80
Youngstown Y1 .....10.80

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....8.175

STRIP, C.R. Electrogalvanized

Cleveland A7 .....7.425*
Dover,O. G6 .....7.425*
Evanston,Ill. M22 ....7.525*
McKeesport,Pa. E10 ...7.50*
Riverdale,Ill. A1 .....7.525*
Warren,O. B9, S3, T5 7.425*
Worcester,Mass. A7 ..7.975
Youngstown S41 .....7.425*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Farrell,Pa. S3 .....7.50
Sharon,Pa. S3 .....7.50

TIGHT COOPERAGE HOOP

Atlanta A11 .....5.65
Farrell,Pa. S3 .....5.525
Riverdale,Ill. A1 .....5.675
Sharon,Pa. S3 .....5.525
Youngstown U5 .....5.525

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$9.10	$9.35	$9.75
Fairfield,Ala. T2	9.20	9.45	9.85
Fairless,Pa. U5	9.20	9.45	9.85
Fontana,Calif. K1	9.75	10.00	10.40
Gary,Ind. U5	9.10	9.35	9.75
GraniteCity,Ill. G4	9.20	9.45	9.60
IndianaHarbor,Ind. I-2, Y1	9.10	9.35	9.75
Irvin,Pa. U5	9.10	9.35	9.75
Niles,O. R2	9.10	9.35	9.75
Pittsburg,Calif. C11	9.75	10.00	10.40
SparrowsPoint,Md. B2	9.10	9.35	9.75
Yorkville,O. W10	9.10	9.35	9.75

ELECTROLYTIC TIN-COATED SHEET (20-27 Ga.; Dollars per 100 lb)			
Aliquippa,Pa. J5	7.90	8.10	
Niles,O. R2	7.725	7.925	8.125

TIN PLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa.J5	$10.40	$10.65
Fairfield,Ala. T2	10.50	10.75
Fairless,Pa. U5..	10.50	10.75
Fontana,Calif.K1	11.05	11.30
Gary,Ind. U5 ..	10.40	10.65
Ind.Harb. Y1 ..	10.40	10.65
Pitts.,Calif. C11.	11.05	11.30
Sp.Pt.,Md. B2 ..	10.40	10.65
Weirton,W.Va.W6	10.40	10.65
Yorkville,O. W10	10.40	10.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5 .....$8.20
Fairfield,Ala. T2 .....8.30
Fairless,Pa. U5 .....8.30
Fontana,Calif. K1 ....8.85
Gary,Ind. U5 .....8.20
GraniteCity,Ill. G4 ....8.30
Ind.Harbor,Ind. I-2, Y1.8.20
Irvin,Pa. U5 .....8.20
Niles,O.* R2 .....8.20
Pittsburg,Calif. C11 ...8.85
SparrowsPoint,Md. B2..8.25
Weirton,W.Va. W6 ....8.20
Yorkville,O. W10 .....8.20

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5 .....7.85
Gary,Ind. U5 .....7.85
GraniteCity,Ill. G4 ....7.95
Ind.Harbor,Ind. Y1 ....7.85
Irvin,Pa. U5 .....7.85
Yorkville,O. W10 .....7.85

MANUFACTURING TERNES (Special Coated, Base Box)

Gary Ind. U5 .....$9.70
Irvin,Pa. U5 .....9.70

ROOFING SHORT TERNES (8 lb Coated, Base Box)

Gary,Ind. U5 .....$11.25

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	.....	11.70	12.40	13.55	14.65
Brackenridge,Pa. A4	.....	.....	12.40	13.55	14.65
GraniteCity,Ill. G4	9.975*	11.30*	12.00*	13.15*	....
IndianaHarbor,Ind. I-2	9.875*	11.20*	11.90*	13.05*	....
Mansfield,O. E6	9.875*	11.70	12.40	13.55	14.65
Newport,Ky. A2	9.875	11.70*	12.40*	13.55*	14.65*
Niles,O. M21	9.875*	11.70	12.40	13.55	....
Vandergrift,Pa. U5	9.875*	11.70	12.40	13.55	14.65
Warren,O. R2	9.875*	11.70	12.40	13.55	14.65
Zanesville,O. A10	.....	11.70†	12.40	13.55	14.65

	Stator
Vandergrift,Pa. U5	8.10
Mansfield,O. E6	8.10

SHEETS (22 Ga., coils & cut lengths) Fully Processed (Semiprocessed ½c lower)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.70	16.30	16.80	17.85
Vandergrift,Pa. U5	15.70	16.30	16.80	17.85
Zanesville,O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	18.10	19.70	20.20	20.70	15.70††	
Butler,Pa. A10	.....	19.70	20.20	20.70	....	
Vandergrift,Pa. U5	17.10	18.10	19.70	20.20	20.70	15.70
Warren,O. R2	.....	.....	.....	.....	.....	15.70‡

*Semiprocessed, † Fully processed only, ‡Coils, annealed, semiprocessed ½c lower, ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

Alabama City,Ala. R2 ..8.00
Aliquippa,Pa. J5 .....8.00
Alton,Ill. L1 .....8.20
Atlanta A1 .....8.00
Bartonville,Ill. K4 .....8.10
Buffalo W12 .....8.00
Chicago W13 .....8.00
Cleveland A7, C20 .....8.00
Crawfordsville,Ind. MS 8.10
Donora,Pa. A7 .....8.00
Duluth A7 .....8.00
Fairfield,Ala. T2 .....8.00
Fostoria,O.(24) S1 .....8.10
Houston S5 .....8.25
Jacksonville,Fla. MS 8.35
Johnstown,Pa. B2 .....8.00
Joliet,Ill. A7 .....8.00
KansasCity,Mo. S5 .....8.25
Kokomo,Ind. C16 .....8.10
LosAngeles B3 .....8.95
Minnequa,Colo. C10 .....8.25
Monessen,Pa. P7, P16 ....8.00
N.Tonawanda,N.Y. B11 ....8.00
Palmer,Mass. W12 .....8.30
Pittsburg,Calif. C11 .....8.95
Portsmouth,O. P12 .....8.00
Rankin,Pa. A7 .....8.00
S.Chicago,Ill. R2 .....8.00
S.SanFrancisco C10 .....8.95
SparrowsPoint,Md. B2 ....8.10
Sterling,Ill.(4) N15 .....8.00
Sterling,Ill. N15 .....8.10
Struthers,O. Y1 .....8.00
Waukegan,Ill. A7 .....8.00
Worcester,Mass. A7 .....8.30

WIRE, Cold Heading Carbon

Elyria,O. W8 .....8.00

WIRE, Gal'd., for ACSR

Bartonville,Ill. K4 .....12.65
Buffalo,W12 .....13.40
Cleveland A7 .....12.65
Donora,Pa. A7 .....12.65
Duluth A7 .....12.65
Johnstown,Pa. B2 .....13.40
Minnequa,Colo. C10 ....12.775
Monessen,Pa. P7, P16..12.65
Muncie,Ind. I-7 .....13.60
NewHaven,Conn. A7 ....12.95
Palmer,Mass. W12 .....13.70
Pittsburg,Calif. C11 ....13.45
Portsmouth,O. P12 .....12.65
Roebling,N.J. R5 .....12.95
SparrowsPt.,Md. B2 ....13.50
Struthers,O. Y1 .....13.40
Trenton,N.J. A7 .....12.95
Waukegan,Ill. A7 .....12.65
Worcester,Mass. A7 ....12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5 .....9.75
Alton,Ill. L1 .....9.95
Buffalo W12 .....9.75
Cleveland A7 .....9.75
Donora,Pa. A7 .....9.75
Duluth A7 .....9.75
Johnstown,Pa. B2 .....9.75
KansasCity,Mo. S5 .....10.00
LosAngeles B3 .....10.70
Minnequa,Colo. C10 .....9.95
Monessen,Pa. P7, P16 ..9.75
NewHaven,Conn. A7 ....10.05
Palmer,Mass. W12 .....10.05
Pittsburg,Calif. C11 ...10.70
Portsmouth,O. P12 .....9.75
Roebling,N.J. R5 .....10.05
S.Chicago,Ill. R2 .....9.75
S.SanFrancisco C10 .....10.70
SparrowsPt.,Md. B2 ..9.85
Struthers,O. Y1 .....9.75
Trenton,N.J. A7 .....10.05
Waukegan,Ill. A7 .....9.75
Worcester,Mass. A7 .....10.05

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5 .....9.75
Alton,Ill. L1 .....9.95
Bartonville,Ill. K4 .....9.85
Buffalo W12 .....9.75
Cleveland A7 .....9.75
Donora,Pa. A7 .....9.75
Duluth A7 .....9.75
Fostoria,O. S1 .....9.80
Johnstown,Pa. B2 .....9.75
KansasCity,Mo. S5 .....10.00
LosAngeles B3 .....10.70
Milbury,Mass.(12) N6 ..10.05
Minnequa,Colo. C10 .....9.95
Monessen,Pa. P7, P16 ....9.75
Muncie,Ind. I-7 .....9.95
Palmer,Mass. W12 .....10.05
Pittsburg,Calif. C11 ....10.70
Portsmouth,O. P12 .....9.75
Roebling,N.J. R5 .....10.05
S.Chicago,Ill. R2 .....9.75
S.SanFrancisco C10 ....10.70
SparrowsPt.,Md. B2 ....9.85
Struthers,O. Y1 .....9.75
Trenton,N.J. A7 .....10.05
Waukegan,Ill. A7 .....9.75
Wor'ster,Mass.A7,J4T6 10.05

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1 .....16.50
Bartonville,Ill. K4 ....16.40
Chicago W13 .....16.30
Cleveland A7 .....16.30
Crawfordsville,Ind. MS.16.40
Fostoria,O. S1 .....16.30
Houston S5 .....16.55
Jacksonville,Fla. MS ...16.65
Johnstown,Pa. B2 .....16.30
KansasCity,Mo. S5 .....16.55
Kokomo,Ind. C16 .....16.30
Minnequa,Colo. C10 ....16.55
Monessen,Pa. P16 .....16.30
Muncie,Ind. I-7 .....16.50
Palmer,Mass. W12 .....16.60
S.SanFrancisco C10 ....17.15
Waukegan,Ill. A7 .....16.30
Worcester,Mass. A7, J6.16.60

WIRE, Tire Bead

Bartonville,Ill. K4 ....17.15
Monessen,Pa. P16 .....17.15
Roebling,N.J. R5 .....17.65

ROPE WIRE (A)

Bartonville,Ill. K4 .....13.45
Buffalo W12 .....13.45
Fostoria,O. S1 .....13.45
Johnstown,Pa. B2 .....13.45
Monessen,Pa. P7 .....13.45
Muncie,Ind. I-7 .....13.65
Palmer,Mass. W12 .....13.75
Portsmouth,O. P12 .....13.45
Roebling,N.J. R5 .....13.75
St.Louis L8 .....12.75
SparrowsPt.,Md. B2 ....13.55
Struthers,O. Y1 .....13.45
Worcester,Mass. J4 .....13.75
(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	12.35
Baltimore T6	12.65
Boston T6	12.65
Buffalo W12	12.35
Chicago W13	12.45
Cleveland A7	12.35
Crawfordsville,Ind. M8	12.35
Dover,O. G6	12.35
Farrell,Pa. S3	11.65
Fostoria,O. S1	12.35
FranklinPark,Ill. T6	12.45
Kokomo,Ind. C16	12.35
Massillon,O. R8	12.35
Milwaukee C23	12.55
Monessen,Pa. P7, P16	12.35
Palmer,Mass. W12	12.65
Pawtucket,R.I. N8	11.95
Philadelphia P24	12.65
Riverdale,Ill. A1	12.45
Rome,N.Y. R6	12.35
Sharon,Pa. S3	12.35
Trenton,N.J. R5	12.65
Warren,O. B9	12.35
Worcester,Mass. A7,T6	12.65

NAILS, Stock

	Col.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. M8	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7	$10.30

NAILS, Cut (100 lb keg)

To Dealers (33)

Wheeling,W.Va. W10	$9.80

POLISHED STAPLES

	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	173
Atlanta A11	177
Bartonville,Ill. K4	177
Crawfordsville,Ind. M8	177
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	180
Jacksonville,Fla. M8	177
Johnstown,Pa. B2	175
Joliet,Ill. A7	173
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	173
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.) (per 97 lb Net Box)

Coil No. 3150

AlabamaCity,Ala. R2	$10.26
Atlanta A11	10.36
Bartonville,Ill. K4	10.36
Buffalo W12	10.26
Chicago W13	10.26
Crawfordsville,Ind. M8	10.36
Donora,Pa. A7	10.26
Duluth A7	10.26
Fairfield,Ala. T2	10.26
Houston S5	10.51
Jacksonville,Fla. M8	10.36
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	10.26
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	10.36
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	11.04
S.Chicago,Ill. R2	10.26
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill. (37) N15	10.36

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$10.60
Atlanta A11	10.70
Bartonville,Ill. K4	10.70
Buffalo W12	10.60
Chicago W13	10.60
Crawfordsville,Ind. M8	10.70
Donora,Pa. A7	10.60
Duluth A7	10.60
Fairfield,Ala. T2	10.60
Houston S5	10.85
Jacksonville,Fla. M8	10.70
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	10.60
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	10.70
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	11.40
S.Chicago,Ill. R2	10.60
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill. (37) N15	10.70

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$10.65
Atlanta A11	10.75
Bartonville,Ill. K4	10.75
Buffalo W12	10.65
Chicago W13	10.65
Crawfordsville,Ind. M8	10.75
Donora,Pa. A7	10.65
Duluth A7	10.65
Fairfield,Ala. T2	10.65
Houston S5	10.90
Jacksonville,Fla. M8	10.75
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	10.65
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	10.75
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	11.45
S.Chicago,Ill. R2	10.65
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill. (37) N15	10.75

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill. (7) N15	214

FENCE POSTS

Birmingham C15	177
ChicagoHts.,Ill. C2, I-2	177
Duluth A7	177
Franklin,Pa. F5	177
Johnstown,Pa. B2	177
Marion,O. P11	177
Minnequa,Colo. C10	182
Sterling,Ill. (1) N15	177
Tonawanda,N.Y. B12	172

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190‡
Atlanta A11	198‡
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. M8	198
Johnstown,Pa. B2	196‡
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196‡
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	198**
S.SanFrancisco C10	213†
SparrowsPoint,Md. B2	198‡
Sterling,Ill. (7) N15	198††

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	187**
Aliq'ppa,Pa.9-11½ga.J5	190‡
Atlanta A11	192‡
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. M8	192
Johnstown,Pa.(43) B2	190‡
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192††

WIRE (16 gage)	An'ld Stone	Galv. Stone
AlaCity,Ala. R2	17.85	19.40**
Aliq'ppa,Pa. J5	17.85	19.65
Bartonville,Ill. K4	17.95	19.75
Cleveland A7	17.85	.....
Craw'dsville,Ind. M8	17.95	19.80‡‡
Fostoria,O. S1	18.35	19.90†
Houston S5	18.10	19.65**
Jacksonville,Fla. M8	17.95	19.80‡‡
Johnstown,Pa. B2	17.85	19.65‡‡
Kan.City,Mo. S5	18.10	.....
Kokomo,Ind. C16	17.25	18.80†
Minnequa,Colo. C10	18.10	19.65**
Plm'r,Mass. W12	18.15	19.70†
Pitts.,Calif. C11	18.20	19.75†
S.SanFran.,Calif. C10	18.20	19.75**
SparrowsPt.,Md. B2	17.95	19.75‡‡
Sterling,Ill.(37) N15	17.25	19.65††
Waukegan,Ill. A7	17.85	19.40†
Worcester,Mass. A7	18.15	.....

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
Ala.City,Ala. R2	9.00	9.55**
Aliquippa,Pa. J5	8.65	9.25‡‡
Atlanta(48) A11	9.10	9.75‡‡
Bartonville(48) K4	9.10	9.75‡‡
Buffalo W12	9.00	9.55†
Cleveland A7	9.00	.....
Crawfordsville,Ind. M8	9.10	9.80‡‡
Donora,Pa. A7	9.00	9.55†
Duluth A7	9.00	9.55†
Fairfield,Ala. T2	9.00	9.55†
Houston(48) S5	9.25	9.80**
Jacksonville,Fla. M8	9.10	9.80‡‡
Johnstown,Pa.(48) B2	9.00	9.675‡‡
Joliet,Ill. A7	9.00	9.55†
Kans.City(48) S5	9.25	9.80**
Kokomo(48) C16	9.10	9.65†
LosAngeles B3	9.95	10.65††
Monessen (48) P7	8.65	9.35‡‡
Palmer,Mass. W12	9.30	9.85†
Pitts.,Calif. C11	9.95	10.50†
Rankin,Pa. A7	9.00	9.55†
S.Chicago R2	9.00	9.55**
S.SanFran. C10	9.95	10.50**
Spar'wsPt.(48) B2	9.10	9.775‡‡
Sterling(48) N15	9.25	9.925††
St'ling(1)(48) N15	9.15	9.825††
Struthers,O. Y1	9.00	9.65†
Worester,Mass. A7	9.30	9.85†

Based on zinc price of: *13.50, †5c, ‡10c. §Less than 10c. ††10.50c. ‡‡11.00c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill)

BOLTS

Machine Bolts

Full Size Body (cut thread)

½ in. and smaller:	
3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0
Longer than 6 in.	37.0
⅝ in., 3 in. & shorter	47.0
3¼ in. thru 6 in.	40.0
Longer than 6 in.	31.0
⅞ in. thru 1 in.:	
6 in. and shorter	37.0
Longer than 6 in.	31.0
1⅛ in. and larger:	
All lengths	31.0

Undersize Body (rolled thread)

½ in. and smaller:	
3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0

Carriage Bolts

Full Size Body (cut thread) & Undersize Body (rolled thread)

½ in. and smaller:	
6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

Lag, Plow, Tap, Blank, Sten, Elevator, Tire, and Fitting Up Bolts

½ in. and smaller:	
6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

High Tensile Structural Bolts

(Reg. semifinished hex head bolts, standard heavy double chamfered hex nuts. Bolts — High-carbon steel, heat treated. Spec. ASTM A-325, in bulk. Full keg quantity)

⅝ in. diam.	50.0
¾ in. diam.	47.0
⅞ and 1 in. diam.	43.0
1¼ and 1½ in. diam.	34.0

NUTS

(Keg or case quantity and over)

Square Nuts, Reg. & Heavy:

All sizes	56.0

(Full container)

Hex Nuts, Reg. & Heavy

Hot Pressed & Cold Punched:

⅜ in. and smaller	62.0
⅞ in. to 1½ in., incl.	56.0
1⅝ in. and larger	51.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

¾ in. and smaller	62.0
⅞ in. to 1½ in., incl.	56.0
1⅝ in. and larger	51.5

Hex Nuts, Finished (Incl. Slotted and Castellated):

¾ in. and smaller	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):

⅜ in. and smaller	62.0
⅞ in. to ⅞ in., incl.	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

CAP AND SETSCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Cap Screws, Course or Fine Thread, Bright:

6 in. and shorter:

¾ in. and smaller	35.0
⅞, 1 in. and 1 in.	16.0
Longer than 6 in.:	
¾ in. and smaller	8.0
⅞, 1 in. and 1 in.	+11.0

High Carbon, Heat Treated:

6 in. and shorter:

⅜ in. and smaller	20.0
⅞, 1 in. and 1 in.	+ 5.0
Longer than 6 in.:	
⅜ in. and smaller	+19.0
⅞, 1 in. and 1 in.	+39.0

Flat Head Cap Screws:

¾ in. and smaller, 6 in. and shorter . . . + 85.0

Setscrews, Square Head, Cup Point, Coarse Thread:

Through 1 in. diam.:

6 in. and shorter	+ 5.0
Longer than 6 in.	+29.0

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.85

⅝ in. and smaller by 6 in. and shorter: 15.0%

PRESTRESSED STRAND

Steel 5½ano6 Kasarda

(High strength, stress relieved; 7 wire uncoated. Net prices per 1000 ft, 40,000 lb and over)

	Strand Diameter, Inches				
	1/4	5/16	3/8	7/16	1/2
Alton,Ill. L1	$32.15	$48.20	$61.55	$81.10	$105.65
Buffalo W12	32.15	48.20	61.55	81.10	105.65
Cleveland A7	32.15	48.20	61.55	81.10	.....
KansasCity,Mo. U3	32.15	48.20	61.55	81.10	105.65
Monessen,Pa. P16	32.15	48.20	61.55	81.10	105.65
NewHaven,Conn. A7	32.15	48.20	61.55	81.10	105.65
Pittsburg,Calif. C11	.....	48.20	61.55	81.10	.....
Pueblo,Colo. W12	32.15	48.20	61.55	81.10	105.65
Roebling,N.J. R5	32.15	48.20	61.55	81.10	105.65
St.Louis L8	32.15	48.20	61.55	81.10	105.65
Waukegan,Ill. A7	32.15	48.20	61.55	81.10	105.65

RAILWAY MATERIALS

	Standard		Tee Rails	
Rails	No. 1	No. 2	All No. 2	60 lb Under
Bessemer,Pa. U5	5.75	5.65	.....	6.725
Ensley,Ala. T2	5.75	5.65	.....	6.725
Fairfield,Ala. T2	.....	.....	.....	6.725
Gary,Ind. U5	5.75	5.65	.....	.....
Huntington,W.Va. C15	.....	.....	.....	6.50
Johnstown,Pa. B2	.....	.....	.....	(16)6.725
Lackawanna,N.Y. B2	5.75	5.65	.....	6.725
Minnequa,Colo. C10	5.75	5.65	.....	7.22
Steelton,Pa. B2	5.75	5.65	.....	.....
Williamsport,Pa. S19	.....	.....	.....	6.725

TIE PLATES

Fairfield,Ala. T2	6.875
Gary,Ind. U5	6.875
Lackawanna,N.Y. B2	6.875
Minnequa,Colo. C10	7.025
Seattle B3	7.025
Steelton,Pa. B2	6.875
Torrance,Calif. C11	6.875

JOINT BARS

Bessemer,Pa. U5	7.25
Fairfield,Ala. T2	7.25
Joliet,Ill. U5	7.25
Lackawanna,N.Y. B2	7.25
Minnequa,Colo. C10	7.25
Steelton,Pa. B2	7.25

AXLES

Ind.Harbor,Ind. S13	9.125
Johnstown,Pa. B2	9.125

TRACK BOLTS, Untreated

Cleveland R2	15.35
KansasCity,Mo. S5	15.35
Lebanon,Pa. B2	15.35
Minnequa,Colo. C10	15.35
Pittsburgh P14	14.75
Seattle B3	15.85

SCREW SPIKES

Lebanon,Pa. B2	15.10

STANDARD TRACK SPIKES

Fairfield,Ala. T2	9.75
Ind.Harbor,Ind. I-2,Y1	10.10
KansasCity,Mo. S5	10.10
Lebanon,Pa. B2	10.10
Minnequa,Colo. C10	10.10
Pittsburgh J5	10.10
Seattle B3	10.60
S.Chicago,Ill. R2	10.10
Struthers,O. Y1	10.10
Youngstown R2	10.10

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1¼ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cots. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ¾" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier only.
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Deld. in mill zone, 6.295c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.875c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 11 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.685c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6.7 Ga.
(49) 3½ in. and smaller rounds; 9.65c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25
Ambridge, Pa. N2	+12.25	....	+5.75	....	+3.25	....	+1.75	....	+1.75	....	+2	....	0.5	....
Lorain, O. N3	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25
Youngstown Y1	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25

ELECTRICWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Alton, Ill. L1	....	....	....	....	....	....	0.25	+17	3.25	+13	6.75	+8.5	9.25	+7.25
Benwood, W. Va. W10	1.5	+27	+10.5	+36	+21	+45.5	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Butler, Pa. F6	4.5	+24	+8.5	+34	+19.5	+44	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Fairless, Pa. N3	....	....	....	....	....	....	0.25	+17	3.25	+13	6.75	+8.5	9.25	+7.25
Fontana, Calif. K1	....	....	....	....	....	....	+10.75	+28	+7.75	+24	+4.25	+19.5	+1.75	+18.25
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	1.25	+16	4.25	+12	7.75	+7.5	10.25	+7.75
Lorain, O. N3	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Sharon, Pa. S1	4.5	+24	+8.5	+34	+19.5	+44	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Sparrows Pt., Md. B2	0.5	+28	+11.5	+37	+22	+45.5	0.25	+17	3.25	+13	6.75	+8.5	9.25	+7.25
Wheatland, Pa. W9	4.5	+24	+8.5	+34	+19.5	+44	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Youngstown R2, Y1	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.72		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	....	....	1.25	+16.5
Alton, Ill. L1	9.75	+6.25	10.25	+5.75	11.75	+5.5	11.75	+5.5	1.25	+16.5	1.25	+16.5
Benwood, W. Va. W10	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Etna, Pa. N2	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Fairless, Pa. N3	9.75	+6.25	10.25	+5.75	11.75	+5.5	11.75	+5.5	1.25	+16.5	1.25	+16.5
Fontana, Calif. K1	+1.25	+17.25	+0.75	+16.75	0.75	+16.5	0.75	+16.5	+9.75	+27.5	+9.75	+27.5
Indiana Harbor, Ind. Y1	10.75	+5.25	11.25	+4.75	12.75	+4.5	12.25	+4.5	2.25	+15.5	2.25	+15.5
Lorain, O. N3	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	....	....	....	....
Sharon, Pa. M6	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	....	....	....	....
Sparrows Pt., Md. B2	9.75	+6.25	10.25	+5.75	11.75	+5.5	11.75	+5.5	1.25	+16.5	1.25	+16.5
Wheatland, Pa. W9	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Youngstown R2, Y1	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5

*Galvanized pipe discounts based on current price of zinc (11.50c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI	—Rerolling—		Forging	H.R.	H.R. Rods; C.F.	Bars; Structural			C.R. Strip; Flat
Type	Ingot	Slabs	Billets	Strip	Wire	Shapes	Plates	Sheets	Wire
201	22.00	27.00	....	36.00	40.00	42.00	39.25	48.50	45.00
202	23.75	30.25	36.50	39.00	40.75	43.00	40.00	49.25	49.25
301	23.25	28.00	37.25	37.25	42.00	44.25	41.25	51.25	47.50
302	25.25	31.50	38.00	40.50	42.75	45.00	42.25	52.00	52.00
302B	25.50	32.75	40.75	45.75	45.00	47.25	44.50	57.00	57.00
303	....	32.00	41.00	46.00	45.50	48.00	45.00	56.75	56.75
304	27.00	33.25	40.50	44.25	45.25	47.75	45.75	55.00	55.00
304L	....	....	48.25	51.50	53.00	55.50	53.50	63.25	63.25
305	28.50	36.75	42.50	47.50	45.25	47.75	46.25	58.75	58.75
308	30.75	38.25	47.25	50.25	52.75	55.75	55.25	63.00	63.00
309	39.75	49.50	57.75	64.50	63.75	67.00	66.00	80.50	80.50
310	49.75	61.50	78.00	84.25	86.50	91.00	87.75	96.75	96.75
314	....	....	77.50	....	86.50	91.00	87.75	99.00	104.25
316	39.75	49.50	62.25	69.25	69.25	73.00	71.75	80.75	80.75
316L	....	55.50	70.00	76.50	77.00	80.75	79.50	89.25	89.25
317	48.00	60.00	76.75	88.25	86.25	90.75	88.50	101.00	101.00
321	32.25	40.00	47.00	53.50	52.50	55.50	54.75	65.50	65.50
330	....	....	118.75	....	132.00	138.50	135.50	149.25	149.25
18-8 CbTa	37.00	46.50	55.75	63.50	61.50	64.75	64.75	79.25	79.25
403	....	....	28.25	....	32.00	33.75	30.00	40.25	40.25
405	19.50	25.50	29.75	36.00	33.50	35.25	32.50	46.75	46.75
410	16.75	21.50	28.25	31.00	32.00	33.75	30.00	40.25	40.25
416	....	....	28.75	....	32.50	34.25	31.25	48.25	48.25
420	26.00	33.50	34.25	41.75	39.25	41.25	40.25	62.00	62.00
430	17.00	21.75	28.75	32.00	32.50	34.25	31.00	40.75	40.75
430F	....	....	29.50	....	33.00	34.75	31.75	51.75	51.75
431	....	28.75	37.75	....	42.00	44.25	41.00	56.00	56.00
446	....	....	39.25	59.00	44.25	46.50	42.75	70.00	70.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steel Inc.; U. S. Steel Corp.; Universal Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel Co., subsidiary of Allegheny Ludlum Steel Corp., Washington Steel Corp.

Clad Steel

	Plates—Carbon Base 5%	10%	15%	20%	Sheets—Carbon Base 20%
Stainless					
302	....	....	....	....	87.50
304	26.05	28.80	31.55	34.30	39.75
304L	30.50	33.75	36.95	40.15	....
316	38.20	42.20	46.25	50.25	58.25
316L	42.30	46.75	51.20	55.65	....
316 Cb	49.90	55.15	60.40	65.65	....
321	31.20	34.50	37.75	41.05	47.25
347	36.90	40.80	44.65	48.55	57.00
405	22.25	24.60	26.90	29.25	....
410	20.55	22.70	24.85	27.00	....
430	21.20	23.45	25.65	27.90	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	62.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	34.75	40.65

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3, nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Reg. Carbon (W-1)	0.330	W-Cr Hot Work (H-12)	0.530
Spec. Carbon (W-1)	0.385	V-Cr Hot Work (H-13)	0.550
Oil Hardening (O-1)	0.505	W Hot Wk. (H-21)	1.425-1.44
V-Cr Hot Work (H-11)	0.505	Hi-Carbon-Cr (D-11)	0.955

Grade by Analysis (%) W	Cr	V	Co	Mo	AISI Designation	$ per lb
18	4	1	....	....	T-1	1.840
18	4	2	....	....	T-2	2.005
13.5	4	3	....	....	T-3	2.105
18.25	4.25	1	4.75	....	T-4	2.545
18	4	2	9	....	T-5	2.915
20.25	4.25	1.6	12.95	....	T-6	4.330
13.75	3.75	2	5	....	T-8	2.485
1.5	4	1	....	8.5	M-1	1.200
6.4	4.5	1.9	....	5	M-2	1.345
6	4	3	....	6	M-3	1.590

Tool steel producers include: A4, A8, B2, B8, C4, C9, C12, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
Birmingham R2	62.00	62.50**	....	....
Birmingham U6	....	62.50**	66.50	....
Woodward,Ala. W15	62.50*	62.50**	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	66.50	66.50	67.00
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon,Mich., delo	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	68.00	68.50	69.00	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.50	76.00	....
Newark,N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland,Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa., deld.	....	67.60	67.60	68.13
Lawrenceville Homestead, Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld.	68.26	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.50	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard,Ohio Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	....
Mansfield,Ohio, deld.	71.30	....	71.80	72.30

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	67.50	68.00	68.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

*Phos. 0.70-0.90%; Phos. 0.30-0.65%, $63.
**Phos. 0.70-0.90%; Phos. 0.30-0.65%, $63.50.
‡Phos. 0.50% up; Phos. 0.30-0.45, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% and $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.035% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry., $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry. 12½ lb piglets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$73.00
Rockwood,Tenn. T3 (Phos. 0.035% max)	73.00
Troy,N.Y. R2 (Phos. 0.035% max)	73.00
Philadelphia, deld.	81.67
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Atlanta	8.59§	9.86§	10.13	....	8.91	9.39	13.24 #	....	9.40	9.29	11.21
Baltimore	8.55	9.25	9.99	....	9.05	9.45	11.85 #	15.48	9.35	9.00	10.50
Birmingham	8.18	9.45	10.46	....	8.51	8.99	....	....	9.00	8.89	10.99
Boston	9.31	10.40	11.39	53.50	9.73	10.11	13.39 #	15.71	10.01	10.02	11.85
Buffalo	8.40	9.60	11.80	55.98	8.75	9.15	11.45 #	15.40	9.25	9.20	10.75
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.25	9.45	10.50	53.00	8.51	8.99	9.15	15.05	9.00	8.89	10.20
Cincinnati	8.43	9.51	10.55	53.43	8.83	9.31	11.53 #	15.37	9.56	9.27	10.53
Cleveland	8.56	9.54	10.20	52.33	8.63	9.10	11.25 #	15.16	9.38	9.13	10.44
Dallas	8.80	9.30	....	....	8.85	8.80	....	....	8.75	9.15	10.40
Denver	9.40	11.84	12.94	....	9.43	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.51	9.71	10.87	56.50	8.88	9.30	9.51	15.33	9.56	9.26	10.46
Erie, Pa.	8.20	9.45	9.95[10]	....	8.60	9.10	11.25	....	9.35	9.10	10.60
Houston	8.40	8.90	10.29	52.00	8.45	8.40	11.60	15.75	8.35	8.75	10.10
Jackson, Miss.	8.52	9.79	....	....	8.84	9.82	10.68	....	9.33	9.22	11.03
Los Angeles	8.70[2]	10.80[2]	12.15[2]	57.60	9.15	9.10[2]	12.95[2]	16.35	9.00[2]	9.10[2]	11.30[2]
Memphis, Tenn.	8.59	9.80	....	....	8.84	9.32	11.25 #	....	9.33	9.22	10.86
Milwaukee	8.39	9.59	10.64	....	8.65	9.13	9.39	15.19	9.22	9.03	10.34
Moline, Ill.	8.55	9.80	....	....	8.84	8.95	9.15	....	8.99	8.91	....
New York	8.87	10.13	10.56	53.08	9.64	9.99	13.25 #	15.50	9.74	9.77	11.05
Norfolk, Va.	8.40	....	....	....	9.10	9.10	12.00	....	9.40	8.85	10.35
Philadelphia	8.20	9.25	11.34	52.71	9.25	9.40	11.95 #	15.48	9.10	9.15	10.40**
Pittsburgh	8.35	9.55	10.90	52.00	8.61	8.99	11.25 #	15.05	9.00	8.89	10.20
Richmond, Va.	8.40	....	10.40	....	9.10	9.00	....	....	9.40	8.85	10.35
St. Louis	8.63	9.83	10.88	....	8.89	9.37	9.78	15.43	9.48	9.27	10.58
St. Paul	8.79	10.04	11.09	....	8.84	9.21	9.86	....	9.38	9.30	10.49
San Francisco	9.65	11.10	11.00	55.10	9.75	10.15	13.00	16.00	9.85	10.00	12.35
Seattle	9.95	11.55[2]	12.45[2]	55.02	10.00	10.10	14.70	16.80[3]	9.80	9.70	12.10
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	9.95	11.55	12.50	57.38	10.55	10.65	14.70	16.80	9.80	9.70	12.10
Washington	9.15	....	....	....	9.65	10.05	12.50	....	10.15	9.60	11.10

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §12 in. and under; **⅛ in. and heavier; ††as annealed; ‡‡¾ in. to 4 in. wide, inclusive; #net price. 1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-finished bars, 2000 lb and over except in Seattle, 2000 to 3999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Seattle, 30,000 lb and over; [2]—30,000 lb; [3]—1000 to 4999 lb; [5]—1000 to 1999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchens, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $165.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $233.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Ft. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., $158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E. Chicago, Ind., Joliet, Rockdale, Ill., $168; Lehigh, Utah, $175; Los Angeles, $180.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $157; Morrisville, Hays, Latrobe, Pa., $168; E. Chicago, Ind., $167; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $140; Philadelphia, $137; Woodbridge, N. J., $135.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000)

50 Per Cent: St. Louis, Mexico, Vandalia, Mo., $235; Danville, Ill., $253; Philadelphia, Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $260.

60 Per Cent: St. Louis, Mexico, Vandalia, Mo., $295; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $310.

70 Per Cent: St. Louis, Mexico, Vandalia, Mo., $335; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $350.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $188.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $310.

Runners (per 1000)

Reesdyle, Johnstown, Bridgeburg, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Sliding, Bonne Terre, Mo., $15.60.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $16; ¾ in. grains with fines: Baltimore, $73.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net ton, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $30-$33, contract; Mexican, all rail, duty paid, $25; barge, Brownsville, Tex., $27.

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, Swedish: deld. east of Mississippi River, ocean bags, 23,000 lb and over; f.o.b. Riverton or Camden, N. J., west of Mississippi River	9.50
Sponge Iron, Domestic, 99 + % Fe: Deld. east of Mississippi River, 23,000 lb and over	10.50
Electrolytic Iron, Melting stock, 99.87% Fe, irregular fragments of ⅜ in. x 1.3 in.	28.75
(in contract lots of 240 tons price is 22.75c)	
Annealed, 99.5% Fe	36.50
Unannealed (99 + % Fe)	36.00
Unannealed (99 + % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh)	29.00
Carbonyl Iron: 98.1-99.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh	
Aluminum: Atomized, 500-lb drum, freight allowed: Carlots	38.50
Ton lots	40.50
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	*33.00-48.90*
Bronze, 5000-lb lots	49.60-53.70†
Copper: Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese: Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	74.00
Nickel-Silver, 5000-lb lots	*50.90-55.40†*
Phosphor-Copper, 5000-lb lots	61.80
Copper (atomized) 5000-lb lots	42.30-50.80‡
Silicon	47.50
Solder	7.00*
Stainless Steel, 304	$1.07
Stainless Steel, 316	$1.26
Tin	14.00*
Zinc, 5000-lb lots 19.00-32.20‡	
Tungsten:	Dollars
Melting grade, 99% 60 to 200 mesh, nominal:	
1000 lb and over	3.15
Less than 1000 lb	3.30
Chromium, electrolytic 99.8% Cr, min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches Diam	Length	Per 100 lb
2	24	$60.75
2½	30	39.25
3	40	37.00
4	40	35.00
5¼	40	34.75
6	60	31.50
7	60	28.25
8, 9, 10	60	28.00
12	72	26.75
14	60	26.75
16	72	25.75
17	60	26.25
18	72	26.25
20	72	25.25
24	84	26.00

CARBON

8	60	13.30
10	60	13.00
12	60	12.95
14	60	12.85
14	72	11.95
17	60	11.85
17	72	11.40
20	84	11.40
20	90	11.00
24	72, 84	11.25
24	96	10.95
30	84	11.05
40, 35	110	10.70
40	100	10.70

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries.)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$5.05	$5.05	$4.95	$5.40
Bar Size Angles	5.05	5.05	5.00	5.38
Structural Angles	5.05	5.05	5.05	5.38
I-Beams	5.11	5.11	5.11	5.45
Channels	5.11	5.11	5.11	5.45
Plates (basic bessemer)	6.62	6.62	6.62	6.94
Sheets, H.R.	8.20	8.20	8.20	8.50
Sheets, C.R. (drawing quality)	8.75	8.75	8.75	9.12
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.71	25.59	25.59	26.46
Barbed Wire (†)	6.65	6.65	6.65	7.00
Merchant Bars	5.40	5.40	5.35	5.90
Hot-Rolled Bands	7.15	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	5.05	5.18	5.00	5.35
Wire Rods, O.H. Cold Heading Quality No. 5	5.80	5.93	5.75	6.05
Bright Common Wire Nails ($)	8.02	8.02	7.92	8.20

†Per 82 lb net reel. §Per 100-lb kegs, 20d nails and heavier.

Ores

Lake Superior Iron Ore

(Prices effective for the 1958 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30, 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, foundry and basic 62-64% concentrates	18.00-19.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	23.00
N. African hematite (spot)	nom
Brazilian iron ore, 68.5%	26.00

Tungsten Ore

Net ton unit

Foreign wolframite, good commercial quality	*$11.20-$11.25**
Domestic, concentrates f.o.b. milling points	16.00-17.00†

*Before duty. †Nominal.

Manganese Ore

Mn 46-48%, Indian (export tax included) $1.10 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; other than Indian, nominal; contracts by negotiation.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian	
48% 3:1	$42.00-44.00
48% 2.8:1	38.00-40.00
48% no ratio	29.00-31.00
South African Transvaal	
44% no ratio	22.00-23.00
48% no ratio	29.00-31.00
Turkish	
48% 3:1	51.00-55.00
Domestic	
Rail nearest seller	
48% 3:1	39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard	
50-55%	$2.25-2.40
60-65%	2.50-3.10

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.75
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$28.85
Cincinnati, deld.	31.84
Buffalo, ovens	30.50
Camden, N. J., ovens	29.50
Detroit, ovens	30.50
Pontiac, Mich., deld.	32.45
Saginaw, Mich., deld.	34.03
Erie, Pa., ovens	30.50
Everett, Mass., ovens: New England, deld.	31.55*
Indianapolis, ovens	29.75
Ironton, Ohio, ovens	29.00
Cincinnati, deld.	31.84
Kearny N. J., ovens	29.75
Milwaukee, ovens	30.50
Neville Island (Pittsburgh), Pa., ovens	29.25
Painesville, Ohio, ovens	30.50
Cleveland, deld.	32.69
Philadelphia, ovens	29.50*
St. Louis, ovens	31.50
St. Paul, ovens	29.75
Chicago, deld.	33.18
Swedeland, Pa., ovens	29.50
Terre Haute, Ind., ovens	29.75

*Or within $5.15 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	31.00‡
Toluene, one deg. (deld.)	25.00*
Industrial xylene	29.00§

Per ton, bulk, ovens

Ammonium sulfate	$32.00-35.00†

Cents per pound, producing point

Phenol: Grade 1, 17.50; Grade 2-3, 15.50; Grade 4, 17.50; Grade 5, 16.50; Grade 6, 14.50.

Effective: *Apr. 12; †July 1; ‡July 8; §Aug.

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Neville Island, Pa., 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx) base price per net ton, $245, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively. (Mn 79-81%). Lump $253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-95%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.5% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn, packed, carload 26.8c, ton lot 28.4c, less ton 29.6c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2%). Carload, lump bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lot 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, bulk, 33.25c; 2000 lb to min carload, 36c; less ton, 38c; 50 lb cans add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi River; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Carload, lump, bulk 1.50% C grade, 18-20% Si, 12.5c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade Si 15-17%, deduct 0.2c from above prices. For 3% grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot 2" x D, $1.50 per lb of contained Ti; less ton to 300 lb, $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton to 300 lb $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract min c.l. $240 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis. Spot, $245.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4%). Contract, c.l. $290 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed. Spot, $295.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk 28.75c per lb of contained Cr; c.l. packed 30.30c, ton lot 32.05c; less ton 33.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Ton lot, add 3.5c; less ton, add 5.2c. Delivered.

Cr 67-71%, carload, lump, bulk, C 0.02% max, 41.00c per lb contained Cr; 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.25c. Ton lot, add 3.4c; less ton lot, add 5.1c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 61-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 30.8c per lb of contained Cr. Packed, c.l. 32.4c, ton 34.2c, less ton 35.7c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload packed, SM x D 21.25c per lb of alloy, ton lot 22.50c; less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk 3" x down and 2" x down, 28.25c per lb contained Cr, 14.60c per lb contained Si. 0.75" x down 29.40c per lb contained Cr, 14.60c per lb contained Si.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min metallic basis, Fe 0.2% max). Contract, carlot, packed 2" x D plate (about ⅛" thick) $1.15 per lb, ton lot $1.17, less ton lot $1.19. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth grade (V 50-55%, Si 5% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55% or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Contract, carload, lump, bulk, 14.6c per lb of contained Si. Packed c.l. 17.1c, ton lot 18.55c, less ton 20.20c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.75c per lb contained silicon. Packed, c.l. 17.75c, ton lot 19.55c, less ton 20.9c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.9c per lb of contained Si. Packed, c.l. 18.8c, ton lot 20.45c, less ton 21.7c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 20c per lb of contained Si. Packed, c.l. 21.65c, ton lot 23.05c, less ton 24.1c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 1.00% max Fe, 0.07% max Ca). C.l. lump, bulk, 21.5c per lb of Si. Packed, c.l. 23.15c, ton lot 24.45c, less ton 25.45c. Add 0.5c for max 0.03% Ca grade. Add 0.5c for 0.50% Fe grade analyzing min 98.25% min Si.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.85c per lb of alloy; ton lot, packed, 10.85c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk, 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c

BORON ALLOYS

Ferroboron: 100 lb or more packed, (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20 Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Carbortam: (B 1 to 2%). Contract, lump, carload $320 per ton, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3% lb each and containing 2 lb of Cr). Contract, carload, bulk 19.60c per lb of briquet, in bags 20.70c; 3000 lb to c.l. pallets 20.80c; 2000 lb to c.l. in bags 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Contract, carload, bulk 14.8c per lb of briquet; c.l., packed, bags 16c; 3000 lb to c.l., pallets 16c; 2000 lb to c.l., bags 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). Contract, c.l. bulk 15.1c per lb of briquet; c.l. packed, bags 16.3c, 3000 lb to c.l., pallets 16.3c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si and small sizes, weighing approx 2½ lb and containing 1 lb of Si). Contract, carload, bulk 8c per lb of briquet; packed, bags 9.2c; 3000 lb to c.l., pallets 9.6c; 2000 lb to c.l., bags 10.8c; less ton 11.7c. Delivered. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.49 per lb of Mo contained, f.o.b. Langeloth, Pa.

Titanium Briquets: Ti 98.27%, $1 per lb, f.o.b. Niagara Falls, N. Y.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.15 per lb (nominal) of contained W. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Ton lots 2" x D, $4 per lb of contained Cb; less ton lots $4.05 (nominal). Delivered.

Ferrotantalum Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lots 2" x D, $3.80 per lb of contained Cb plus Ta, delivered; less ton lots $3.85 (nominal).

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, c.l. packed ½-in. x 12 M 20.00c per lb of alloy, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 20c per lb of alloy, ton lot 21.15c; less ton lot 22.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

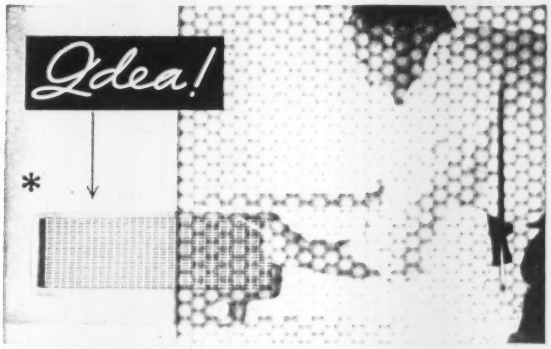
V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.45c per lb of alloy; ton lot 19.95c; less ton lot 21.20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 19.25c. Packed c.l. 20.25c, 2000 lb to c.l. 21.25c; less than 2000 lb 21.75c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $5 for each 1% of P above or below the base). Carload, bulk, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $120 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo, in 200-lb container, f.o.b. Langeloth and Washington, Pa. $1.76 in all sizes except powdered which is $1.82.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans, $1.47; in bags, $1.46, f.o.b. Langeloth and Washington, Pa.



*Product Development by William M. Schmidt Associates.

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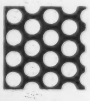

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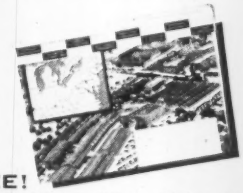

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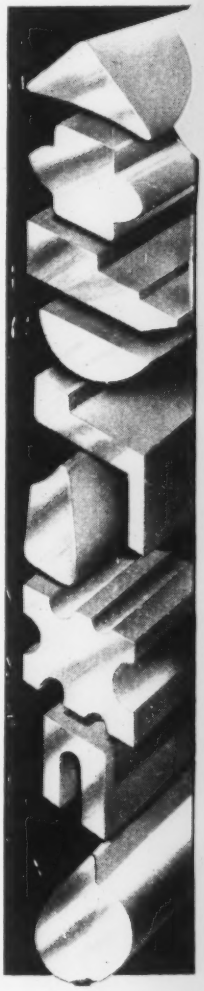

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S-3

Scrap Declines in Slow Market

STEEL's composite on the prime grades drops $1.66 a ton to $40.67 as weakness develops in the East and Pittsburgh. Mills favoring hot metal at expense of dealer scrap

Scrap Prices, Page 156

Philadelphia—The No. 1 grades of open hearth scrap and electric furnace bundles have dropped $3 a ton on light sales. Weakness is due to light business, and dull prospects for the near future. Lack of foreign demand also is a depressing factor.

No. 1 heavy melting, No. 1 bundles, No. 1 busheling, and electric furnace bundles are holding at $37, delivered. No. 2 heavy melting is off $2 a ton to $34, delivered, and No. 2 bundles are off 50 cents to $23.50. Heavy turnings have dropped from $34-$35 to a flat $33, delivered, and low phos structurals and plates are $39-$40 against $43-$44 previously. Heavy breakable cast is off slightly to $42-$43, delivered.

Pittsburgh—Scrap prices are falling as major consumers relight more blast furnaces. Dealers are disappointed because one of the big mills failed to buy in November, and a smaller producer who has been a consistent buyer of small tonnages withdrew from the market. Brokers think a mill could buy all the No. 1 heavy melting scrap it wanted at $42 or $43 a ton.

New York — Scrap business is dull, with brokers' buying prices on No. 1 heavy melting and No. 1 bundles off $1 to $28-$29; No. 2 heavy melting is at $25-$26. Low phos structurals and plates are down $1 to $36-$37. All other major steel grades are unchanged, as are the cast grades. Stainless scrap specialties are steady.

Chicago—Except for No. 1 railroad heavy melting and No. 2 bundles, scrap prices are steady. Those grades are now $1 higher than previously quoted. Demand continues light, with few mills buying. There's a possibility that the district steelmaking rate has peaked out for this year and that the next upward push in operations won't come until early next year. Evidence that this may be so: Two weeks ago, operations were scheduled for 88 per cent of capacity, but hit only 86 per cent, while last week's projection was 84.5 per cent. Foundry activity is up slightly, and cast scrap prices are steady.

Cleveland—Quoted prices on the steel grades are nominal in the absence of representative mill buying. No. 1 heavy melting continues $39.50-$40.50. Dealers say month end auto lists will indicate the market trend over the remainder of the year. While the district steelmaking rate went up 2 points last week to 71 per cent of capacity, mill preference for hot metal is limiting demand for dealer material.

Detroit—The market is quiet, but dealers are hoping for a buying pickup by the end of this month when mills may seek scrap for Jan-

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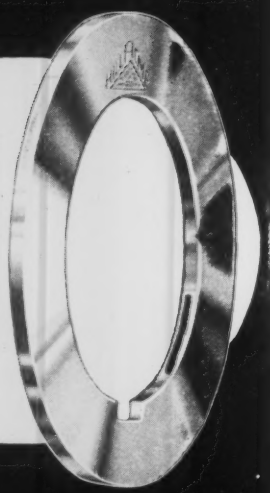

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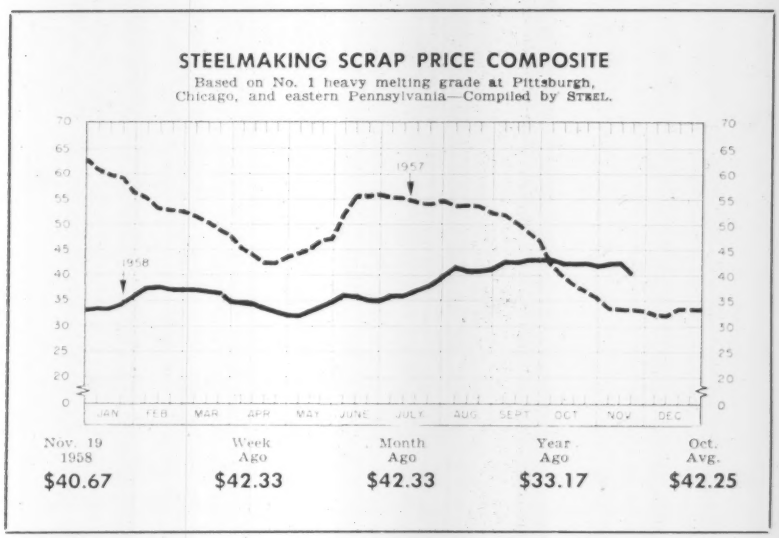
STEELMAKING SCRAP PRICE COMPOSITE
Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania—Compiled by STEEL.
1957
1958
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
Nov. 19 1958 $40.67
Week Ago $42.33
Month Ago $42.33
Year Ago $33.17
Oct. Avg. $42.25

uary melts. Because of local taxes (as high as $1.10 a ton on scrap in yards at yearend) there's not likely to be much buying for inventory the rest of this year.

The strike at Chrysler cut scrap generation. (The company turns out 2000 to 3000 tons of scrap daily when operating at full capacity.) The situation is expected to build up demand for available tonnage.

Buffalo—The market is quiet, and prices are holding. Consumers are showing only mild interest in offerings. Dealers are shipping against mill orders placed early this month, their tonnage consisting largely of No. 2 heavy melting and No. 2 bundles. The bulk of the No. 1 grades moving to the mills is direct from plants. Cast scrap is quiet. Canadian foundries are bidding for western New York cast; the activity is lending some support to the market.

Cincinnati—With no new buying here to provide a test of the market, brokers are continuing to quote first-of-the-month prices. Scrap generation is picking up with industrial activity.

St. Louis—Scrap supply and demand are pretty well balanced. The market is firm, with the undertone strong. No evidence of significant price shifts is in prospect. The open hearth grades are moving steadily, but the tonnage available is sufficient for current requirements. More hot metal is being used in open hearth melts.

Birmingham — The outlook for demand over the remainder of the year is not too promising, but brokers are hoping they will be able to maintain prices close to the present level, even though they lowered their quotations $2 a ton on the No. 1 steel grades last week.

The leading district buyer is out of the market, and the strike at the Atlanta mill continues. A railroad list that came out last week found few buyers, and prices on the few purchases made were down $1 from last quotations. The electric furnace and cast iron grades are moving slowly.

Houston — Substantial tonnages of scrap overhang the Texas market, but brokers' prices are unchanged on the basis of an order placed recently by a leading district mill. Shipments are moving ahead on this order, and indications are there will be no more mill buying this year. Mexican purchases are limited, and export activity is lacking.

Seattle — Some scrapyards have accumulated stocks, but others are out of inventory. Receipts are light because prevailing prices are not attractive to inland shippers. Generally, dealers are optimistic. They anticipate an early pickup in mill buying.

Dealers operating in the Aleutian Islands (where there is still a lot of military scrap) are not moving the material because of the unfavorable market.

San Francisco — Shipments of steel scrap to Japan have been light in recent months, but there's talk of additional orders developing soon. The market continues quiet with prices unchanged.

Los Angeles—Little tonnage is moving in this district, and the undertone of the market is weaker. Mill stocks are adequate for current steel operations.

Strikes Harass Important Metalworking Plants

Labor troubles continue to plague production in important areas of metalworking.

International Harvester Co. may lay off some 300 workers at its Wisconsin Steel Div. unless the strike of the United Auto Workers at 15 of its plants is quickly settled. The walkout of 36,500 employees caused the company to lay off 300 at its Waukesha, Wis., foundry. A substantial portion of the 2000 at its Milwaukee part plant will be furloughed if the strike continues beyond Nov. 26.

The UAW strike at the three plants of the Caterpillar Tractor Co. is continuing. Some 500 workers at the company's Joliet (Ill.) plant were laid off Nov. 14.

The work stoppage at the Gary, Ind., plant of Budd Co. was ended last weekend when employees voted to go back to work pending a strike settlement. A walkout of 1100 Budd workers idled 15,000 at the Milwaukee and Kenosha (Wis.) plants of American Motors.

Rails, Cars . . .

Track Material Prices, Page 148

Domestic freight car orders declined in October to 781 units, vs. 1582 in September and 2202 in October, 1957, reports the American Railway Car Institute and the Association of American Railroads.

Deliveries came to 1591, against 2131 in September and 8295 in October last year.

Order backlogs as of Nov. 1 totaled 23,670 cars, compared with 24,892 on Oct. 1, and 65,718 a year ago.

Chesapeake & Ohio Railway has ordered fifty, 85 ft flatcars for its initial venture into piggyback operations early next year. The cars, designed to carry two over-the-road trailers, are being built by the Berwick (Pa.) plant of American

(*Please turn to Page* 162)

Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, Nov. 19, 1958. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Nov. 19	$40.67
Nov. 12	42.33
Oct. Avg.	42.25
Nov. 1957	33.17
Nov. 1953	35.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	*42.00-43.00*
No. 2 heavy melting	*33.00-34.00*
No. 1 dealer bundles	*42.00-43.00*
No. 2 bundles	*30.00-31.00*
No. 1 busheling	*42.00-43.00*
No. 1 factory bundles	49.00-50.00
Machine shop turnings	*22.00-23.00*
Mixed borings, turnings	*22.00-23.00*
Short shovel turnings	*25.00-26.00*
Cast iron borings	*25.00-26.00*
Cut structurals, 2 ft and under	49.00-50.00
Cut structurals, 3 ft lengths	48.00-49.00
Heavy turnings	34.00-35.00
Punchings & plate scrap	49.00-50.00
Electric furnace bundles	49.00-50.00

Cast Iron Grades

No. 1 cupola	*44.00-45.00*
Stove plate	41.00-42.00
Unstripped motor blocks	31.00-32.00
Clean auto cast	39.00-40.00
Drop broken machinery	*51.00-52.00*

Railroad Scrap

No. 1 R.R. heavy melt	47.00-48.00
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Random rails	54.00-55.00
Railroad specialties	52.00-53.00
Angles, splice bars	52.00-53.00
Rails, rerolling	60.00-61.00

Stainless Steel Scrap

18-8 bundles & solids	225.00-230.00
18-8 turnings	125.00-130.00
430 bundles & solids	125.00-130.00
430 turnings	55.00-65.00

CHICAGO

No. 1 hvy melt, indus.	43.00-45.00
No. 1 heavy melt, dealer	40.00-41.00
No. 2 heavy melting	34.00-35.00
No. 1 factory bundles	47.00-48.00
No. 1 dealer bundles	42.00-43.00
No. 2 bundles	*29.00-30.00*
No. 1 busheling, indus.	43.00-45.00
No. 1 busheling, dealer	40.00-41.00
Machine shop turnings	22.00-23.00
Mixed borings, turnings	24.00-25.00
Short shovel turnings	24.00-25.00
Cast iron borings	24.00-25.00
Cut structurals, 3 ft	46.00-47.00
Punchings & plate scrap	47.00-48.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Stove plate	43.00-44.00
Unstripped motor blocks	37.00-38.00
Clean auto cast	51.00-52.00
Drop broken machinery	51.00-52.00

Railroad Scrap

No. 1 R.R. heavy melt	*46.00-47.00*
R. R. malleable	55.00-56.00
Rails, 2 ft and under	58.00-59.00
Rails, 18 in. and under	59.00-60.00
Angles, splice bars	54.00-55.00
Axles	67.00-68.00
Rails, rerolling	62.00

Stainless Steel Scrap

18-8 bundles & solids	215.00-220.00
18-8 turnings	115.00-120.00
430 bundles & solids	115.00-120.00
430 turnings	55.00-60.00

YOUNGSTOWN

No. 1 heavy melting	43.00-44.00
No. 2 heavy melting	30.00-31.00
No. 1 busheling	43.00-44.00
No. 1 bundles	43.00-44.00
No. 2 bundles	30.00-31.00
Machine shop turnings	15.00-16.00
Short shovel turnings	20.00-21.00
Cast iron borings	20.00-21.00
Low phos.	46.00-47.00
Electric furnace bundles	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt.	46.00-47.00

CLEVELAND

No. 1 heavy melting	39.50-40.50
No. 2 heavy melting	26.00-27.00
No. 1 factory bundles	46.00-47.00
No. 1 bundles	39.50-40.50
No. 2 bundles	30.50-31.50
No. 1 busheling	39.50-40.50
Machine shop turnings	14.00-15.00
Short shovel turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Cast iron borings	20.00-21.00
Cut foundry steel	41.00-42.00
Cut structurals, plates 2 ft and under	48.00-49.00
Low phos. punchings & plate	41.00-42.00
Alloy free, short shovel turnings	22.00-23.00
Electric furnace bundles	42.50-43.50

Cast Iron Grades

No. 1 cupola	44.00-45.00
Charging box cast	37.00-38.00
Heavy breakable cast	36.00-37.00
Stove plate	43.00-44.00
Unstripped motor blocks	32.00-33.00
Brake shoes	36.00-37.00
Clean auto cast	49.00-50.00
Burnt cast	33.00-34.00
Drop broken machinery	49.00-50.00

Railroad Scrap

R.R. malleable	63.00-64.00
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Rails, random lengths	52.00-53.00
Cut steel	49.00-50.00
Railroad specialties	50.00-51.00
Uncut tires	43.00-44.00
Angles, splice bars	50.00-51.00
Rails, rerolling	56.00-57.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	205.00-215.00
18-8 turnings	115.00-120.00
430 clips, bundles, solids	110.00-120.00
430 turnings	40.00-50.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	38.00
No. 2 heavy melting	36.00
No. 1 bundles	40.00
No. 2 bundles	29.00
No. 1 busheling	40.00
Machine shop turnings	20.00†
Short shovel turnings	22.00†

Cast Iron Grades

No. 1 cupola	49.00
Charging box cast	40.00
Heavy breakable cast	38.00
Unstripped motor blocks	39.00
Clean auto cast	49.00
Stove plate	46.00

Railroad Scrap

No. 1 R.R. heavy melt	45.50
Rails, 18 in. and under	52.00†
Rails, random lengths	48.00
Rails, rerolling	*60.00*
Angles, splice bars	48.00

BIRMINGHAM

No. 1 heavy melting	*36.00-37.00†*
No. 2 heavy melting	30.00-31.00†
No. 1 bundles	*36.00-37.00†*
No. 2 bundles	23.00-24.00
No. 1 busheling	*36.00-37.00†*
Cast iron borings	13.00-14.00
Machine shop turnings	24.00-25.00
Short shovel turnings	25.00-26.00
Bars, crops and plates	44.00-45.00
Structurals & plates	43.00-44.00
Electric furnace bundles	40.00-41.00
Electric furnace: 2 ft and under	38.00-39.00
3 ft and under	37.00-38.00

Cast Iron Grades

No. 1 cupola	54.00-55.00
Stove plate	53.00-54.00
Unstripped motor blocks	42.00-43.00
Charging box cast	29.00-30.00
No. 1 wheels	*42.00-43.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*38.00-39.00*
Rails, 18 in. and under	52.00-53.00
Rails, rerolling	58.00-59.00
Rails, random lengths	47.00-48.00
Angles, splice bars	*47.00-48.00*

PHILADELPHIA

No. 1 heavy melting	*37.00*
No. 2 heavy melting	*34.00*
No. 1 bundles	*37.00*
No. 2 bundles	*28.50*
No. 1 busheling	*37.00*
Electric furnace bundles	*37.00*
Mixed borings, turnings	20.00-21.00†
Short shovel turnings	23.00-24.00†
Machine shop turnings	19.00-20.00†
Heavy turnings	*34.00*
Structurals & plate	*39.00-40.00*
Couplers, springs, wheels	*42.00-43.00*
Rails, crops, 2 ft & under	57.00-58.00

Cast Iron Grades

No. 1 cupola	41.00
Heavy breakable cast	*42.00-43.00*
Malleable	58.00
Drop broken machinery	49.00-50.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*28.00-29.00*
No. 2 heavy melting	*25.00-26.00*
No. 1 bundles	*28.00-29.00*
No. 2 bundles	19.00-20.00
Machine shop turnings	10.00-11.00
Mixed borings, turnings	11.00-12.00
Short shovel turnings	14.00-15.00
Low phos. (structurals & plates)	*36.00-37.00*

Cast Iron Grades

No. 1 cupola	36.00-37.00
Unstripped motor blocks	28.00-29.00
Heavy breakable	33.00-34.00

Stainless Steel

18-8 sheets, clips, solids	190.00-195.00
18-8 borings, turnings	90.00-95.00
410 sheets, clips, solids	65.00-70.00
430 sheets, clips, solids	85.00-90.00

BUFFALO

No. 1 heavy melting	35.00-36.00
No. 2 heavy melting	29.00-30.00
No. 1 bundles	35.00-36.00
No. 2 bundles	27.00-28.00
No. 1 busheling	35.00-36.00
Mixed borings, turnings	17.00-18.00
Machine shop turnings	15.00-16.00
Short shovel turnings	19.00-20.00
Cast iron borings	17.00-18.00
Low phos. structurals and plate, 2 ft and under	43.00-44.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	44.00-45.00
No. 1 machinery	48.00-49.00

Railroad Scrap

Rails, random lengths	48.00-49.00
Rails, 3 ft and under	54.00-55.00
Railroad specialties	43.00-44.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	38.50-39.50
No. 2 heavy melting	33.50-34.50
No. 1 bundles	38.50-39.50
No. 2 bundles	26.00-27.00
No. 1 busheling	38.50-39.50
Machine shop turnings	19.00-20.00
Mixed borings, turnings	17.00-20.00
Short shovel turnings	22.00-23.00
Cast iron borings	19.00-20.00
Low phos, 18 in.	46.00-47.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Heavy brakable cast	38.00-39.00
Charging box cast	36.00-37.00
Drop broken machinery	47.00-48.00

Railroad Scrap

No. 1 R.R. heavy melt.	44.00-45.00
Rails, 18 in. and under	55.00-56.00
Rails, random lengths	49.00-50.00

HOUSTON

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	40.00
No. 2 heavy melting	34.00
No. 1 bundles	40.00
No. 2 bundles	25.00
Machine shop turnings	17.00
Short shovel turnings	20.00
Low phos. plates & structurals	45.50

Cast Iron Grades

No. 1 cupola	47.00
Heavy breakable	30.00†
Foundry malleable	41.00
Unstripped motor blocks	37.00

Railroad Scrap

No. 1 R.R. heavy melt.	38.00†

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	29.00-30.00
No. 2 heavy melting	23.00-24.00
No. 1 bundles	29.00-30.00
No. 2 bundles	17.00-18.00†
No. 1 busheling	29.00-30.00
Machine shop turnings	9.00-10.00
Short shovel turnings	12.00-13.00
No. 1 cast	33.00-34.00
Mixed cupola cast	33.00-34.00
No. 1 machinery cast	36.00-38.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	35.00-36.00
No. 2 heavy melting	22.50-23.50
No. 1 bundles	36.00-37.00
No. 2 bundles	22.50-23.50
No. 1 busheling	35.00-36.00
Machine shop turnings	13.00-14.00
Mixed borings, turnings	14.00-15.00
Short shovel turnings	15.00-16.00
Punchings & plate	34.00-35.00

Cast Iron Grades

No. 1 cupola	46.00-47.00
Stove plate	36.00-37.00
Charging box cast	37.00-38.00
Heavy breakable	37.00-38.00
Unstripped motor blocks	31.00-32.00
Clean auto cast	48.00-49.00

SEATTLE

No. 1 heavy melting	30.00†
No. 2 heavy melting	28.00†
No. 1 bundles	22.00†
No. 2 bundles	20.00†
Machine shop turnings	9.00-10.00†
Mixed borings, turnings	9.00-10.00†
Electric furnace No. 1	38.00†

Cast Iron Grades

No. 1 cupola	31.00†
Heavy breakable cast	28.00†
Unstripped motor blocks	23.00†
Stove plate (f.o.b. plant)	21.00†

LOS ANGELES

No. 1 heavy melting	34.00
No. 2 heavy melting	32.00
No. 1 bundles	30.00
No. 2 bundles	17.00
Machine shop turnings	11.00
Shoveling turnings	13.00
Cast iron borings	13.00
Cut structurals and plate 1 ft and under	45.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	46.00

Railroad Scrap

No. 1 R.R. heavy melt.	38.00

SAN FRANCISCO

No. 1 heavy melting	32.00
No. 2 heavy melting	30.00
No. 1 bundles	30.00
No. 2 bundles	22.00
Machine shop turnings	15.00
Mixed borings, turnings	15.00
Cast iron borings	15.00
Heavy turnings	15.00
Short shovel turnings	15.00
Cut structurals, 3 ft	40.00

Cast Iron Grades

No. 1 cupola	44.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT.

No. 1 heavy melting	30.00
No. 2 heavy melting	26.00
No. 1 bundles	30.00
No. 2 bundles	23.00
Mixed steel scrap	25.00
Mixed borings, turnings	15.00
Busheling, new factory: Prepared	30.00
Unprepared	24.00
Short steel turnings	19.00

Cast Iron Gradest

No. 1 machinery cast	39.00-41.00

*Brokers' buying price.
†Nominal.
‡F.o.b. Hamilton, Ont.

FAMOUS FALLACIES *about industrial advertising*

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Sales Top Forecasts

Free World deliveries of copper to fabricators hit all-time high in October. Zinc, lead, and nickel demand is also strong. Government has new barter program

Nonferrous Metal Prices, Pages 160 & 161

"OPTIMISTS" who predicted the fourth quarter would see a resurgence in the nonferrous industry are wearing smiles. Business has not only lived up to expectations; it has surpassed them. The remainder of the quarter looks equally rosy.

• **Copper**—Free World deliveries to fabricators in October hit an all-time high of 293,379 tons (see chart), reports the Copper Institute. Producers' stocks tumbled to 268,775 tons, marking the sixth straight month of decline. In the U. S., shipments jumped 20,000 tons (to 121,692 tons), the best performance since June, 1956. Producers' stocks declined 50,000 tons (to 128,490 tons).

Undoubtedly, some buying is for inventory replenishment, metalmen say. The question is whether the surge signals a little less demand later on.

No end to the copper spiral is in sight. November sales should come close to matching October's and early reports indicate December will be a good month. Some quarters see the possibility of a temporary shortage in the U. S. if foreign users make it sufficiently attractive to ship metal overseas.

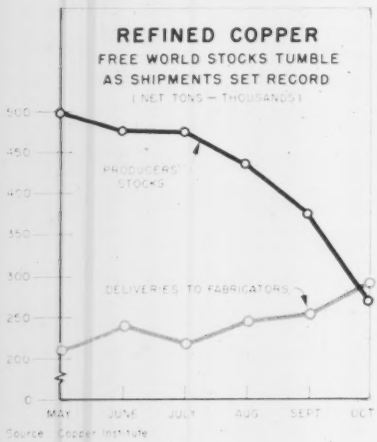
Prices look stable, though there are some rumblings of an increase.

• **Zinc**—Sales continue to run at a fast clip, but the pace isn't as brisk as it was a short time ago. November should come close to matching October—may even surpass it. December will be a good month, but it's still a little early to tell if it will hold to the levels of October and November.

Demand for diecasting metal continues heavy. Producers had to eat into inventories to fill October demand and will have to deplete stocks even more to take care of orders this month. Since automotive demand isn't near its peak, look for a further tightening in special high grade metal.

Don't be surprised if zinc prices edge up in the next few weeks.

• **Lead**—While early fourth quarter demand was far above expectations, much of the buying has been for inventory.



Orders have slowed down to a walk. Some metalmen hope business will improve as Detroit picks up speed but point out the industry is beginning to enter its traditional "slow" period.

If the law of supply and demand were the only force at work, lead probably couldn't maintain its present price position. But other bullish factors (such as barter) should keep quotations stable over the short haul.

• **Nickel** — Customers are buying more metal to fill current needs and to strengthen inventories. Steel mills have stepped up purchases. So have automakers. Electroplaters are still quiet.

The early part of the fourth quarter brought the best business of the year, and indications are the next few weeks will be even better.

Barter Returns

A revamped barter program (swapping U. S. agricultural surpluses for foreign minerals) has been worked up by the Department of Agriculture. It makes 26 minerals (including lead and zinc) eligible for barter contracts.

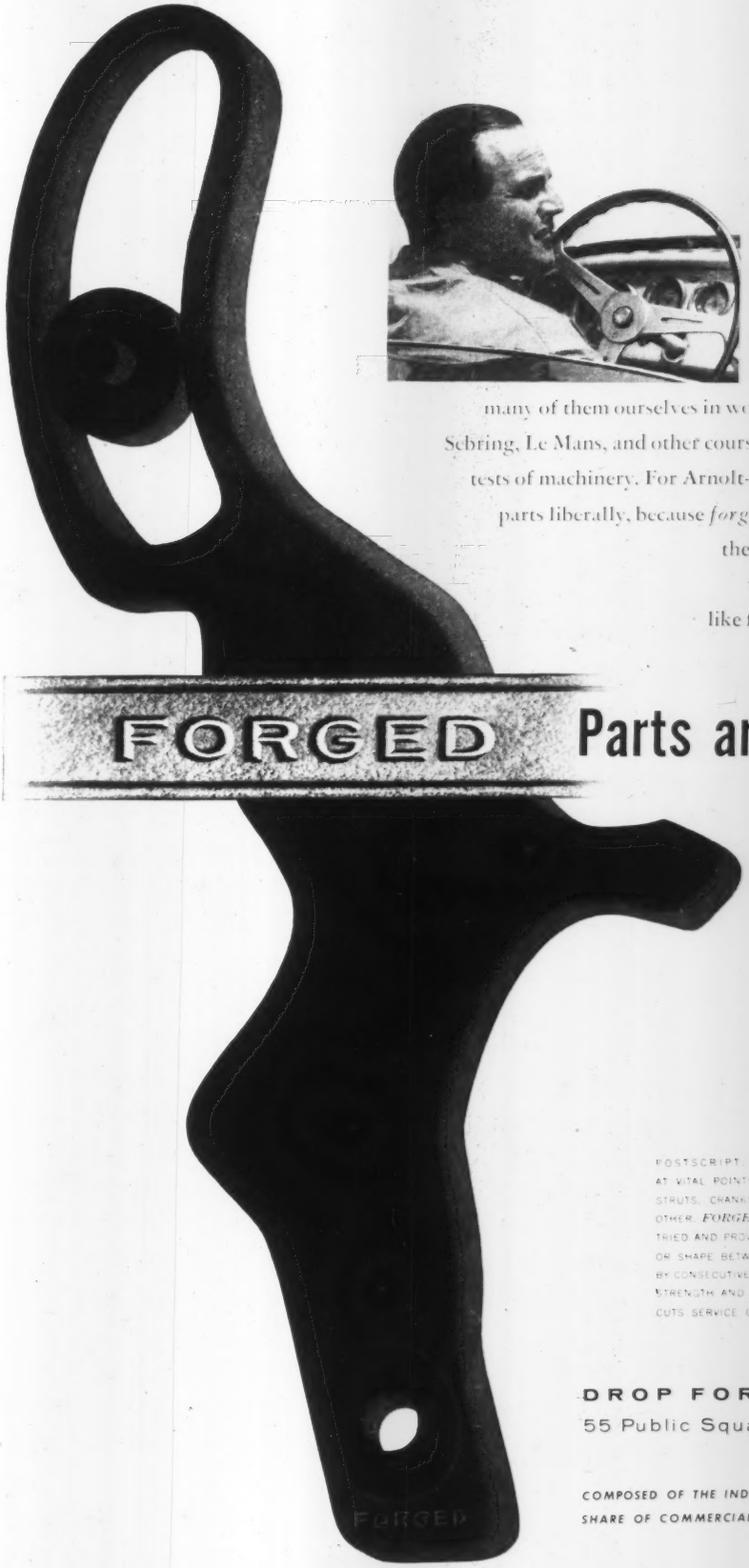
Two restrictions which made recent programs for domestic lead and zinc companies virtually worthless have been removed. Foreign origin concentrates cannot be processed in the U. S. Parties entering into a contract no longer have to show the transaction would be in addition to normal trade agreements.

The workability of the program is still an unknown. Regulations are not too clear and will need interpretation. A clinker may be the President's statement to program administrators: Only those barter deals "that will expand the total exports of agricultural commodities without disrupting world markets" should be approved.

NONFERROUS PRICE RECORD

	Price Nov. 19	Last Change	Previous Price	Oct. Avg	Sept. Avg	Nov., 1957 Avg
Aluminum	24.70	Aug. 1, 1958	24.00	24.700	24.700	26.000
Copper	29.00–30.00	Oct. 24, 1958	27.50–30.00	28.058	26.428	26.217
Lead	12.80	Oct. 14, 1958	12.30	12.473	10.730	13.300
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	99.625	Nov. 19, 1958	99.50	96.500	94.120	89.288
Zinc	11.50	Nov. 7, 1958	11.00	10.865	10.000	10.000

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig, 99.8%, Velasco, Tex.



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"We design and build Arnolt-Bristols, and drive many of them ourselves in world-famous road races, at Sebring, Le Mans, and other courses. These road races are grueling tests of machinery. For Arnolt-Bristol cars, we use *forged* parts liberally, because *forged* parts are dependable when the going is tough. To win, to win safely, we depend on dependable parts, like forgings."

FORGED Parts are Dependable

when the going is tough

POSTSCRIPT: THE PRODUCTS OF THE FORGING INDUSTRY ARE FOUND AT VITAL POINTS OF MODERN CONVEYANCES AND MACHINES... LEVERS, STRUTS, CRANKSHAFTS, GEARS. THE FORGING PROCESS IS UNLIKE ANY OTHER. *FORGED* PARTS START WITH REFINED METALS—METALS ALREADY TRIED AND PROVED. THESE METALS ARE GIVEN ALMOST ANY DESIRED FORM OR SHAPE BETWEEN IMPRESSION DIES, UNDER ENORMOUS PRESSURE OR BY CONSECUTIVE BLOWS FROM POWERFUL HAMMERS. THE RESULT IS ADDED STRENGTH AND TOUGHNESS . . . WHICH PERMITS WEIGHT-SAVING DESIGNS, CUTS SERVICE COSTS, HELPS PROVIDE SAFETY IN A HIGH-SPEED WORLD.

DROP FORGING ASSOCIATION

55 Public Square Cleveland 13, Ohio

COMPOSED OF THE INDEPENDENT COMPANIES PRODUCING THE MAJOR SHARE OF COMMERCIAL FORGINGS IN THE UNITED STATES & CANADA

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 24.70; ingots, 26.80, 30,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.60; No. 43, 28.40; No. 195, 29.10; No. 214, 30.20; No. 356, 28.60; 30 or 10 lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 24.50-25.50, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $13 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.45 per lb deld.

Cobalt: 97.99%, $2.00 per lb for 550-lb keg; $2.02 per lb for 100 lb case; $2.07 per lb under 100 lb.

Columbium: Powder, $55-85 per lb, nom.

Copper: Electrolytic, 29.00 deld.; custom smelters, 30.00; lake, 29.00 deld.; fire refined, 28.75 deld.

Germanium: First reduction, $179.17-197.31 per lb; intrinsic grade, $197.31-220 per lb, depending on quantity.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $70-80 nom. per troy oz.

Lead: Common, 12.80; chemical, 12.90; corroding, 12.90, St. Louis. New York basis, add 0.20.

Lithium: 98 + %, 50-100 lb, cups or ingots, $12; rod, $15; shot or wire, $16. 100-500 lb, cups or ingots, $10.50; rod, $14; shot or wire, $15, f.o.b. Minneapolis.

Magnesium: Pig, 35-25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, 9Z91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $228-231 per 76-lb flask.

Molybdenum: Unalloyed, turned extrusions, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. points of entry, contained nickel, 69.60.

Osmium: $70-100 per troy oz nom.

Palladium: $15-17 per troy oz.

Platinum: $57-60 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $118-125 per troy oz.

Ruthenium: $15-55 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market, 90.125 per troy oz.

Sodium: 17.00 c.l.; 19.00-19.50 l.c.l.

Tantalum: Rod, $60 per lb; sheet, $55 per lb.

Tellurium: $1.65-1.85 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot, 99.375; prompt, 99.25.

Titanium: Sponge, 99.3 + % grade A-1, ductile (0.3% Fe max.), $1.62-1.82; grade A-2 (0.5% Fe max.), $1.70 per lb.

Tungsten: Powder, 89.8%, carbon reduced, 1000-lb lots, $3.15 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.30-3.80.

Zinc: Prime Western, 11.50; brass special, 11.75; intermediate, 12.00, East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 12.50; special high grade, 12.75 deld. Diecasting alloy ingot No. 3, 14.00; No. 2, 14.25; No. 5, 14.50 deld.

Zirconium: Reactor grade sponge, 100 lb or less, $7 per lb; 100-500 lb, $6.50 per lb; over 500 lb, $6 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 23.50-25.25; No. 12 foundry alloy (No. 2 grade), 21.50-22.00; 5% silicon alloy, 0.60 Cu max., 24.75-25.00; 13 alloy 0.60 Cu max., 24.75-25.00; 195 alloy, 25.25-26.00; 108 alloy, 22.25-22.50. **Steel** deoxidizing grades, notch bars, granulated or shot: Grade 1, 22.75; grade 2, 21.50; grade 3, 20.50; grade 4, 18.00.

Brass Ingot: Red brass, No. 115, 29.00; tin bronze, No. 225, 38.00; No. 245, 32.75; high-leaded tin bronze, No. 305, 33.25; No. 1 yellow, No. 405, 24.00; manganese bronze, No. 421, 25.75.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.885, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.865, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 20,000-lb lots, 34.35; l.c.l., 34.98. Weatherproof, 20,000-lb lots, 35.54; l.c.l., 36.29.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $18.50 per cwt; pipe, full coils, $18.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheets and strip, $8.50-15.95; sheared mill plate, $6.00-9.50; wire, $6.50-10.50; forging billets, $3.80-4.35; hot-rolled and forged bars, $5.10-6.25.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 24.00; ribbon zinc in coils, 20.50; plates, 19.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R., strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strip, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100, 3003, and 5005 mill finish (30,000 lb base; freight allowed).

Thickness Range, Inches	Flat Sheet	Coiled Sheet
0.250-0.136	42.80-47.30	.....
0.136-0.096	43.20-48.30	.....
0.126-0.103	.....	39.20-39.80
0.096-0.077	43.80-50.00	39.30-40.00
0.077-0.068	44.30-52.20	.....
0.077-0.061	.....	39.50-40.70
0.068-0.061	44.30-52.20	.....
0.061-0.048	44.90-54.40	40.10-41.80
0.048-0.038	45.40-57.10	40.60-43.20
0.038-0.030	45.70-62.00	41.00-45.70
0.030-0.024	46.20-53.70	41.30-45.70
0.024-0.019	46.90-56.80	42.40-44.10
0.019-0.017	47.70-54.10	43.00-44.70
0.017-0.015	48.60-55.00	43.80-45.50
0.015-0.014	49.60	44.80-46.50
0.014-0.012	50.80	45.50
0.012-0.011	51.80	46.70
0.011-0.0095	53.50	48.10
0.0095-0.0085	54.60	49.60
0.0085-0.0075	56.20	50.80
0.0075-0.007	57.70	52.30
0.007-0.006	59.30	53.70

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.40	47.20
5050-F	43.50	48.30
3004-F	44.50	50.20
5052-F	45.10	50.90
6061-T6	45.60	51.70
2024-T4	49.30	56.10
7075-T6*	57.60	64.70

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (In.) or across flats*	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
0.125	76.90	73.90	.....	.....
0.250	62.00	60.20	89.10	76.60
0.375	61.20	60.00	73.50	68.50
0.500	61.20	60.00	73.50	68.50
0.625	61.20	60.00	69.80	64.20
0.750	59.70	58.40	63.60	60.40
0.875	59.70	58.40	63.60	60.40
1.000	59.70	58.40	63.60	60.40
1.125	57.30	56.10	61.50	58.30
1.250	57.30	56.10	61.50	58.30
1.350	57.30	56.10	61.50	58.30
1.500	57.30	56.10	61.50	58.30
1.625	55.00	53.60	.....	56.20
1.750	55.00	53.60	60.30	56.20
1.875	55.00	53.60	.....	56.20
2.000	55.00	53.60	60.30	56.20
2.125	53.50	52.10	.....	.....
2.250	53.50	52.10	.....	56.20
2.375	53.50	52.10	.....	.....
2.500	53.50	52.10	.....	56.20
2.625	.....	50.40	.....	.....
2.750	51.90	50.40	.....	56.20
2.875	.....	50.40	.....	.....
3.000	51.90	50.40	.....	56.20
3.125	.....	50.40	.....	.....
3.250	.....	50.40	.....	.....
3.375	.....	50.40	.....	.....

*Selected sizes.

Forging Stock: Round, Class 1, random lengths, diam. 0.375-8 in., "F" temper; 2014, 42.20-55.00; 6061, 41.60-55.00; 7075, 61.60-75.00; 7070, 66.60-80.00.

Pipe: ASA schedule 40, alloy 6063-T6 standard lengths, plain ends, 30,000 lb base, dollars per 100 ft. Nominal pipe sizes: ⅜ in., 18.85; 1 in., 29.75; 1¼ in., 40.30; 1½ in., 48.15; 2 in., 58.30; 4 in., 160.20; 6 in., 287.55; 8 in., 432.70.

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	42.70-44.20	51.30-55.50
12-14	42.70-44.20	52.00-56.50
15-17	42.70-44.20	53.20-58.20
18-20	43.20-44.70	55.20-60.80

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grades, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24.72 in. widths; .125 in., 74.90; .188 in., 71.70-72.10; .25-.75 in., 70.60-71.60. Tooling plate, .25-.30 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots.)

Copper and Brass: No. 1 heavy copper and wire, 23.00-23.50; No. 2 heavy copper and wire, 20.75-21.25; light copper, 18.75-19.25; No. 1 composition red brass, 17.00-17.50; No. 1 com-

BRASS MILL PRICES

MILL PRODUCTS a

	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes
Copper	52.13b	49.36c	.....	52.39
Yellow Brass	45.57	30.22d	46.11	48.48
Low Brass, 80%	48.23	48.17	48.77	51.04
Red Brass, 85%	49.17	49.11	49.71	51.98
Com. Bronze, 90%	50.65	50.59	51.19	53.21
Manganese Bronze	53.44	47.64	58.08	.....
Muntz Metal	47.85	43.66	.....	.....
Naval Brass	49.74	44.05	56.80	52.90
Silicon Bronze	56.77	55.96	56.81	62.13
Nickel Silver, 10%	60.70	63.03	63.03	.....
Phos. Bronze	71.09	71.59	71.59	72.77

SCRAP ALLOWANCES e (Based on copper at 29.00c)

Clean Heavy	Rod Ends	Clean Turnings
25.000	25.000	24.250
17.000	16.750	15.250
21.250	21.000	20.500
22.125	21.875	21.375
22.875	22.625	22.125
17.750	17.500	16.875
17.875	17.625	17.125
17.625	17.375	16.875
24.625	24.625	23.625
23.875	23.625	11.937
25.875	25.625	24.625

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

position turnings, 16.00-16.50; new brass clippings, 17.00-17.50; light brass, 11.00-11.50; heavy yellow brass, 12.00-12.50; new brass rod ends, 14.00-14.50; auto radiators, unsweated, 13.75-14.25; cocks and faucets, 14.00-14.50; brass pipe, 14.00-14.50.

Lead: Heavy, 8.50-9.00; battery plates, 4.75-5.25; linotype and stereotype, 10.50-11.00; electrotype, 9.00-9.50; mixed babbitt, 9.50-10.00.

Monel: Clippings, 32.00-34.00; old sheets, 28.00-30.00; turnings, 22.00-24.00; rods, 32.00-34.00.

Nickel: Sheets and clips, 52.00-55.00; rolled anodes, 52.00-55.00; turnings, 37.00-40.00; rod ends, 52.00-55.00.

Zinc: Old zinc, 4.00-4.25; new diecast scrap, 3.75-4.00; old diecast scrap, 2.50-2.75.

Aluminum: Old castings and sheets, 9.75-10.25; clean borings and turnings, 6.50-7.00; segregated low copper clips, 13.00-13.50; segregated high copper clips, 12.00-12.50; mixed low copper clips, 12.75-13.25; mixed high copper clips, 11.25-11.75.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 11.00-11.50; clean borings and turnings, 10.00-10.50; segregated low copper clips, 16.50-17.00; segregated high copper clips, 15.50-16.00; mixed low copper clips, 16.00-16.50; mixed high copper clips, 15.00-15.50.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 11.00-11.50; clean borings and turnings, 10.00-10.50; segregated low copper clips, 15.00-15.50; segregated high copper clips, 13.50-14.00; mixed low copper clips, 14.50-15.00; mixed high copper clips, 13.00-13.50.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 55.00; light scrap, 50.00; turnings and borings, 35.00.

Copper and Brass: No. 1 heavy copper and wire, 25.50; No. 2 heavy copper and wire, 24.50; light copper, 22.75; refinery brass (60% copper) per dry copper content, 23.00.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 25.50; No. 2 heavy copper and wire, 24.50; light copper, 22.75; No. 1 composition borings, 20.00; No. 1 composition solids, 20.50; heavy yellow brass solids, 14.50; yellow brass turnings, 13.50; radiators, 16.75.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.45.

Copper: Flat-rolled, 45.79; oval, 44.00; 5000-10,000 lb; electrodeposited, 38.50, 2000-5000 lb lots; cast, 41.00, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25, 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 117.50; 200-499 lb, 116.00; 500-999 lb, 115.50; 1000 lb or more, 115.00.

Zinc: Balls, 18.00; flat tops, 18.00; flats, 20.75; ovals, 20.00, ton lots.

CHEMICALS

Cadmium Oxide: $1.45 per lb in 100-lb drums.

Chromic Acid (flake): 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,000 lb or more, 29.50.

Copper Cyanide: 100-200 lb, 65.90; 300-900 lb, 63.90; 1000-19,900 lb, 61.90.

Copper Sulphate: 100-1900 lb, 14.65; 2000-5900 lb, 12.65; 6000-11,900 lb, 12.40; 12,000-22,900 lb, 12.15; 23,000 lb or more, 11.65.

Nickel Chloride: 100 lb, 45.00; 200 lb, 43.00; 300 lb, 42.00; 400-4900 lb, 40.00; 5000-9900 lb, 38.00; 10,000 lb or more, 37.00.

Nickel Sulphate: 5000-22,999 lb, 29.00; 23,000-39,990 lb, 28.50; 40,000 lb or more, 28.00.

Sodium Cyanide (Cyanobrik): 200 lb, 20.80; 400-800 lb, 19.80; 1000-19,800 lb, 18.80; 20,000 lb or more, 17.80.

Sodium Stannate: Less than 100 lb, 78.00; 100-600 lb, 68.80; 700-1900 lb, 66.00; 2000-9900 lb, 64.10; 10,000 lb or more, 62.80.

Stannous Chloride (anhydrous): 25 lb, 153.20; 100 lb, 148.30; 400 lb, 145.90; 800-19,900 lb, 105.00; 20,000 lb or more, 98.90.

Stannous Sulphate: Less than 50 lb, 138.40; 50 lb, 108.40; 100-1900 lb, 106.40; 2000 lb or more, 104.40.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

AVAILABLE!
COMPLETE PRODUCTION FACILITIES

Complete facilities in greater Chicago area now available for production work on large steel castings and forgings, big structural units, heavy machining and assembly work. Plant manned by skilled workmen accustomed to working to close tolerances. Fully-equipped tool room and tool design facilities.

STEEL FOUNDRY with open hearth and electric furnaces with capacity of 1,500 tons per month. Can handle 25-ton castings.

BRASS FOUNDRY—Capacity, 100 tons per month. Can handle single castings to 1,300 lbs.

OPEN HAMMER FORGE SHOP with manipulator capacity of 6,000 lbs.

ERECTING—42,000 sq. ft. of floor space.

MODERN HEAT TREATING AND ANNEALING DEPARTMENT with both oil and water quenching facilities.

HEAVY MACHINING—Modern machine tools include 72" x 264" engine lathe and 11' x 50' planer. Also, vertical and horizontal boring mills, gear cutters to 18' dia., etc.

FABRICATING — Shearing, rolling, and brake-forming equipment; complete welding shop including 50-ton positioner.

WE WELCOME YOUR INQUIRY!

ADDRESS BOX 702 , STEEL, Penton Bldg., Cleveland 13, Ohio.

PERSONNEL WANTED
for
SMALL MERCHANT & RE-BAR ROLLING MILL AND MELT PLANT

Mill now being built in Fairbanks, Alaska, and will be in operation in April, 1959. Mill will roll mainly reinforcing bars and will produce during the months of April through October, but key personnel will be compensated on an annual basis.

Personnel inquiries requested for melters, chemists, rollers, superintendents, managers and lesser related positions. Please enclose full particulars, including picture and reference, in first letter to

ALASKA STEEL MILLS, INC.
7707-7th Ave. So.
Seattle, Washington

IMMEDIATE DELIVERY
COMPLETE SLITTING AND CUT TO LENGTH LINES
All Sizes from 12" to 96"

From 1,000 Lb. Coils to 50,000 Lb. Coils

- Uncoilers
- Slitters
- Recoilers
- Gauge Tables
- Hump Tables
- Scrap Ballers
- Choppers
- Slitter Knives
- Slitter Spacers
- Rubber Tires
- Coil Cradles

*** FREE CATALOGUE ***

UNIVERSAL GEAR & MACHINE CO.
1305 E. McNichols Road
DETROIT 3, MICHIGAN
FOrest 6-2280

CLASSIFIED

Positions Wanted

PURCHASING EXECUTIVE: 14 years experience. Heavy in raw materials and purchase parts. Ability to head up large or small department. Experienced in purchasing procedures, systems and value analysis. Thorough knowledge of materials control, scheduling and expediting. Plant phase out requires relocation. Write Box 705, STEEL, Penton Bldg., Cleveland 13, Ohio.

YEARS OF EXPERIENCE ON ELECTRICS AND open hearths. Ingots and foundry. Desire Sales and Service work. Reply Box 704, STEEL, Penton Bldg., Cleveland 13, Ohio.

SALES REPRESENTATIVE—Engineering and purchasing background, mechanical, piping. 10 years with steel producer. 2 years in gas industry. Write Box 706, STEEL, Penton Bldg., Cleveland 13, Ohio.

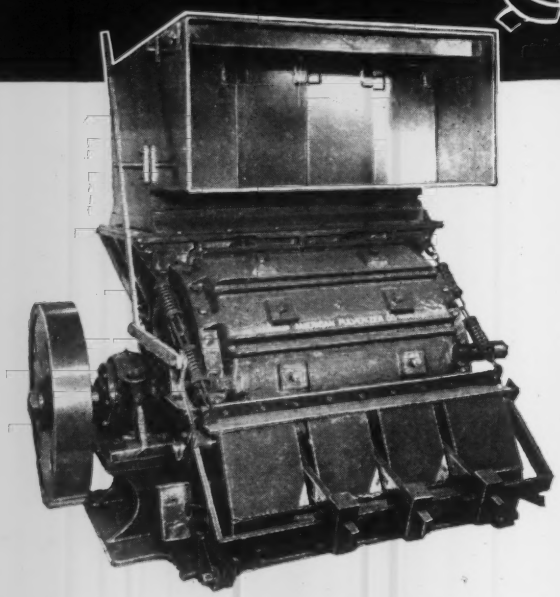
GRADUATE METALLURGIST WANTED

Graduate Metallurgist, not over 35, with degree in Metallurgy or Metallurgical Eng. Must have Ferrous background and several years experience, preferably in electric furnace shop producing rolled product. Duties primarily in production and development and will include test evaluation.

Reply Box 701, STEEL
Penton Bldg. Cleveland 13, Ohio

WE CAN HELP YOU TO CONTACT high calibre men to fill specific jobs you have in mind—
Readers of STEEL include men of wide training and experience in the various branches of the metalworking industry.
When you have an opportunity to offer, use the Help Wanted columns of STEEL.

Here's A Curly Cue To New Market Value For Your Machine Turnings



American METAL TURNINGS Crusher

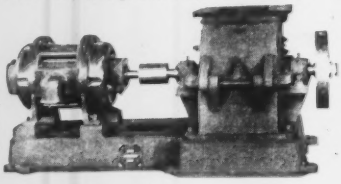
That single machine turning of curled-up steel shown above can be mighty troublesome and costly to your operations.

Gnarled up with thousands of others like itself, it becomes a problem in space . . . gallons of re-usable cutting oil are trapped in the folds . . . and the scrap value is greatly minimized.

Answer? Run this tangled waste through an efficient, AMERICAN METAL TURNINGS CRUSHER. Out come sized ships that are easy to handle for shoveling or pneumatic handling . . . easy to store (savings in space up to 75%) . . . easy to spin for oil recovery . . . and crushed turnings command a higher price.

The cost is easy, too, on your scrap recovery program. Pays for itself.

RECLAIM FUSED WELDING FLUX
American Hammermill reduces fused flux to fine regranulation for perfect re-use. Why throw away profits! Details on request.



"Write for Metal Turnings Bulletin"

American PULVERIZER COMPANY

Originators and Manufacturers of Ring Crushers and Pulverizers

1539 MACKLIND AVE. • ST. LOUIS 10, MO.

(Concluded from Page 155)

Car & Foundry Co. Delivery of ten cars a day is scheduled to start in February.

Metal Can Shipments Rise In First Nine Months

Metal can shipments during the first nine months of this year came to 3,688,374 tons, vs. 3,612,859 tons in 1957's first three quarters, reports the Bureau of the Census. September shipments were 522,870 tons, vs. 589,680 in August, and 495,134 in September, 1957.

Imported Steel Involves Wide Product Range

A wide range of foreign steel products is being imported through the Port of Houston. Principal items are: Reinforcing bars, wire products, merchant bars, and plates.

While no general pattern has evolved, some imported steel prices are reported to have been raised 5 cents per 100 pounds in the Texas market.

Electrode Prices Raised

National Carbon Co., a division of Union Carbide Corp., New York, last week increased prices about 5 per cent on carbon and graphite electrodes, graphite anodes, and miscellaneous carbon and graphite products.

Distributors . . .

Prices, Page 150

Following mild improvement in September and October, business has leveled off at steel service centers. Some distributors anticipate no gain in bookings over the remainder of the year. In fact, the trend may be downward with the yearend holiday and inventory-taking seasons approaching.

Structural steel remains in the doldrums in the Chicago area, but most other products are in good demand there. Galvanized sheets are especially active and are being stocked a little more heavily by distributors. Mill deliveries extend two months or longer, tending to slow down the accumulation of reserves.

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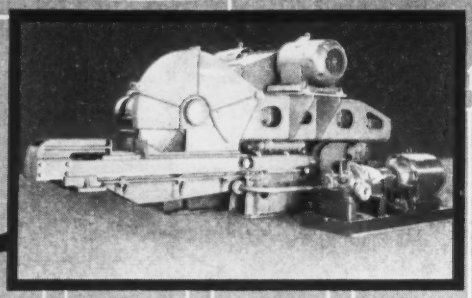
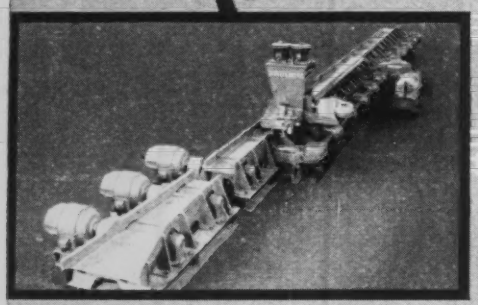
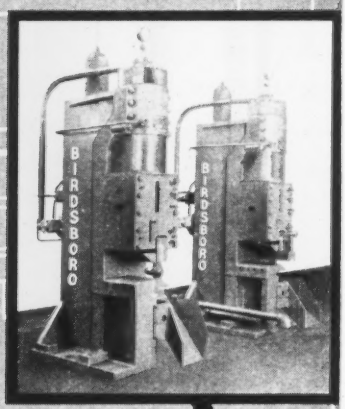
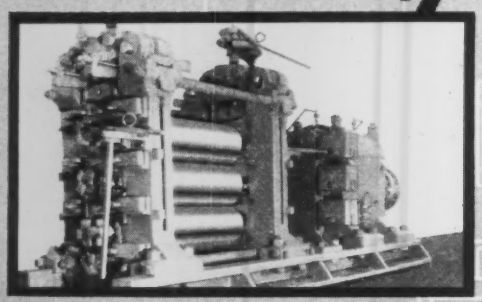
Rolls
ALLOY-CHILLED
Hyde Park
RAMS
for all types of
HYDRAULIC
EQUIPMENT
Hyde Park Rams are available in Chilled or Alloy Iron.
Furnished in hardness range to meet your specification . . . ground to your required size.
On your next replacement of Rams—or for new equipment—consult us. Our engineers will be glad to assist you.
Red Circle Rolls for every Purpose
Rolling Mill Equipment
Gray Iron Castings up to 80,000 lb.
Hyde Park
FOUNDRY & MACHINE CO.
Hyde Park, Westmoreland Co., Pa.
ROLLS
ROLLING MILL MACHINERY
GRAY IRON CASTINGS









New production economies **start** *at the design stage . . .*

At Birdsboro modern design-engineering helps you attain the production economies you want on the job. That's why we place such importance on the idea stage of every job, and why we can sell "not just machines, but ideas, too." You'll find many competitive advantages in talking to Birdsboro when your next mill machinery job goes into the works.

Main Office, Engineering Department and Plant: Birdsboro, Pa., *District Office:* Pittsburgh, Pa.

Illustrated above is a portion of a completely integrated Birdsboro merchant bar mill.

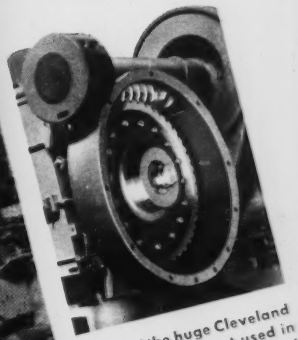
a. 54" Hot Saw Gauge b. 54" Hot Saw
c. 100 ton Crop Shears d. 16" 3-Hi Mill Stand

M-670-58

BIRDSBORO

STEEL FOUNDRY AND MACHINE CO.

STEEL MILL MACHINERY • HYDRAULIC PRESSES • CRUSHING MACHINERY • SPECIAL MACHINERY • STEEL CASTINGS • Weldments "CAST-WELD" Design • ROLLS: Steel, Alloy Iron, Alloy Steel



View of the huge Cleveland Worm and Gear set used in this 150 Series All-Steel Shear, built by The Cincinnati Shaper Co.

CLEVELAND gearing helps this giant shear 1½" steel plate

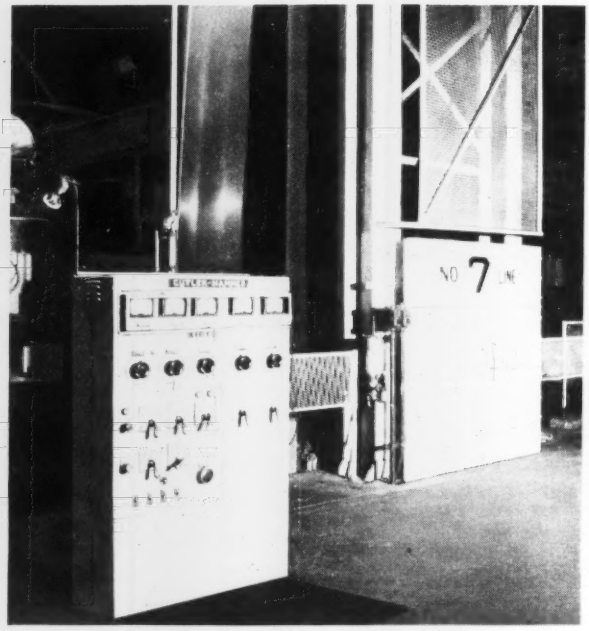
THE terrific pressures generated in cutting a 1½" steel plate 12 feet long are as nothing to this giant shear. Reason: Because there is plenty of extra power, transmitted through Cleveland Worm Gearing.

Whenever a drive must operate under extreme pressures, there you'll find Cleveland Worm Gearing at its best. And a Cleveland drive stays dependably on the job no matter how severe the service. It doesn't wear out—its efficiency actually improves with use.

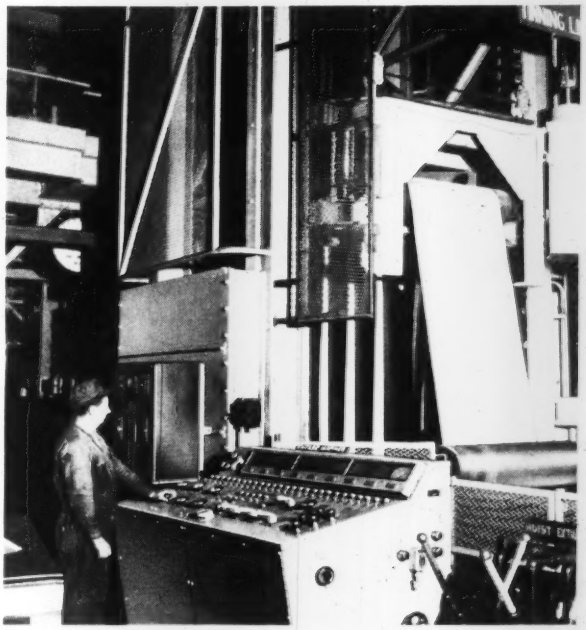
Write for Bulletin 145 which illustrates the many types and sizes of units available in Cleveland Worm Gear Speed Reducers and Drives. Our sales representative near you will sit down with you at your convenience to analyze your drive problems and help you select Clevelands best suited to your needs. The Cleveland Worm and Gear Company, 3270 East 80th Street, Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers, Limited.

CLEVELAND
Worm Gear
Speed Reducers



No. 7 Entry Station—Cutler-Hammer Control regulates the strip speed as the endless ribbon of steel is fed into the electrolytic tinning line. Maximum line speed is 1,000 feet per minute.

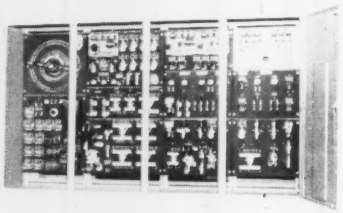


No. 7 Exit Station—From start to finish, the entire operation has been under Cutler-Hammer Control. Cutler-Hammer differential plating control automatically maintains the proper plate thickness for each side of the strip regardless of line speed.

Line after line . . . year after year it's Cutler-Hammer

During the past five years, five electrolytic tinning lines have been installed at intervals in this well-known mill. A sixth line is now being installed. All six are completely equipped with Cutler-Hammer Control! The motor drives have Cutler-Hammer Control. The plating control is Cutler-Hammer . . . control with magnetic amplifier regulation to automatically maintain any preselected plating thickness regardless of line speed. And this is differential plating in which the thickness of plating on the top and bottom of the strip is controlled independently.

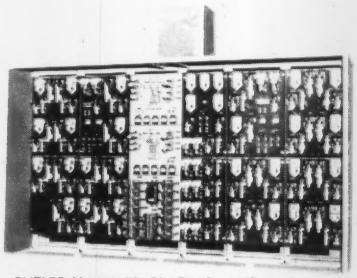
In mill after mill across the country, the performance of Cutler-Hammer control equipment year after year for job after job provides impressive proof of its dependability. This has been going on for more than 60 years. You, too, will find it pays to look to Cutler-Hammer for lasting satisfaction in the handling of all your mill control problems. For detailed information write to Dept. V-213, Cutler-Hammer Inc., Milwaukee 1, Wisconsin.



CUTLER-HAMMER LINE PROCESSING CONTROL SECTION

CUTLER·HAMMER
CONTROL
C·H

Look to Cutler-Hammer Mill Experience . . . as broad as it is long



CUTLER-HAMMER PLATING AND CLEANING GENERATOR CONTROL SECTION

CUTLER·HAMMER

Cutler-Hammer Inc., Milwaukee, Wis. • *Division:* **Airborne Instruments Laboratory.** • *Subsidiary:* **Cutler-Hammer International, C. A.**

Associates: Canadian Cutler-Hammer, Ltd.; Cutler-Hammer Mexicana, S. A.; Intercontinental Electronics Corporation, Inc.